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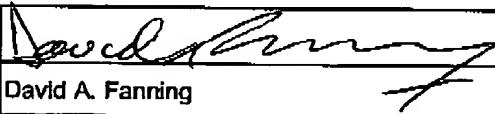
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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of  
**STEPHEN F. GASS, ANDREW L. JOHNSTON,  
JOEL F. JENSEN, SUNG H. KIM,  
DAVID A. FANNING, and ROBERT L.  
CHAMBERLAIN**

Date: February 21, 2006

Serial No.: 09/929,240

Examiner Boyer D. Ashley

Filed: August 13, 2001

Group Art Unit 3724

For: FIRING SUBSYSTEM FOR USE IN A FAST-ACTING SAFETY SYSTEM

Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

**APPEAL BRIEF**

**1. Real party in interest.**

The real party in interest is SD3, LLC, the assignee of the above-identified application. SD3 is a privately owned Oregon limited liability company.

**2. Related appeals and interferences.**

All other known prior and pending appeals, interferences or judicial proceedings which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal are listed below. These appeals are listed because SD3, LLC is the real party in interest and the appeals relate to various aspects of safety systems for power equipment.

1. Appeal of application serial number 09/929,221 (appeal brief filed, awaiting examiner's answer).
2. Appeal of application serial number 09/929,227 (notice of appeal filed).

3. Appeal of application serial number 09/929,238 (appeal brief filed, awaiting examiner's answer).
4. Appeal of application serial number 09/929,242 (appeal brief filed, awaiting examiner's answer).
5. Appeal of application serial number 09/929,425 (appeal brief filed, awaiting examiner's answer).
6. Appeal of application serial number 09/929,426 (examiner reopened prosecution after applicant filed an appeal brief).
7. Appeal of application serial number 10/053,390 (appeal brief filed, awaiting examiner's answer).
8. Appeal of application serial number 10/100,211 (appeal brief filed, awaiting examiner's answer).
9. Appeal of application serial number 10/189,027 (appeal brief filed, awaiting examiner's answer).
10. Appeal of application serial number 10/189,031 (appeal brief filed, awaiting examiner's answer).
11. Appeal of application serial number 10/243,042 (examiner reopened prosecution after applicant filed an appeal brief).
12. Appeal of application serial number 10/292,607 (notice of appeal filed).

**3. Status of claims.**

The application was filed with claims 1-34. Claims 16-20, 22-24 and 27-33 were cancelled without prejudice and claims 6 and 7 were withdrawn from consideration. Claims 1-5, 8-15, 21, 25, 26 and 34 are rejected. The appealed claims are claims 1-5, 8-15, 21, 25, 26 and 34.

**4. Status of amendments.**

All amendments have been entered.

**5. Summary of claimed subject matter.**

The claims at issue in this appeal relate to new safety systems for cutting machines such as table saws, miter saws and other woodworking machinery. Those machines have cutting tools or blades that present a danger to persons using the machines, and each year tens of thousands of people in the United States are severely injured on those machines.<sup>1</sup> Generally, the new safety systems include a detection subsystem to detect a dangerous condition between a person and the cutting tool and a reaction subsystem to mitigate any possible injury when the dangerous condition is detected. One embodiment of the technology is a table saw configured to detect contact between a person and the blade and to stop the blade upon detection of contact. Such table saws are now being sold under the name SawStop and those saws have already saved the hands or fingers of at least 31 different people who had accidents while using

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<sup>1</sup> The U.S. Consumer Product Safety Commission, National Electronic Injury Surveillance System, Directorate for Epidemiology, estimates 58,958 injuries involving various types of power saws and 20,899 injuries involving "saws, not specified" during 2004. (These statistics are publicly available at [www.cpsc.gov](http://www.cpsc.gov). The relevant product codes for searching include codes 825, 832, 841, 842, 843, and 845.)

the saws.<sup>2</sup> Those people likely would have suffered life-changing lacerations or amputations if they had been working on non-SawStop saws. Instead, in each case the person walked away with no more than a scratch. Applicant has filed a number of patent applications on various aspects and configurations of the new safety systems, and this is one of those applications. This application focuses on the use of a fusible member to trigger a reaction subsystem.

Specifically, independent claim 1, describes a cutting machine having a blade (such as blade 40 shown in Figures 2 and 3), and a detection system configured to detect a dangerous condition between a person and the blade (such as detection subsystem 22 shown schematically in Figure 1). Detection systems are discussed in paragraphs 27 and 28 of the published specification and on page 6, lines 1-19 in the specification as submitted. An exemplary implementation of a detection system is discussed in paragraph 32 of the published specification and on page 8, line 20 through page 9, line 13 in the specification as submitted. Claim 1 also requires a reaction system adapted to perform a specified action to mitigate possible injury from the dangerous condition (such as reaction subsystem 24 shown schematically in Figure 1). Reaction systems are discussed in paragraphs 29 and 30 of the published specification and on page 6, line 20 through page 8, line 2 in the specification as submitted. An exemplary implementation of a reaction system is discussed in paragraphs 34-36 of the published specification, which corresponds to page 10, line 9 through page 12, line 3 in the specification as submitted. Claim 1 also requires a fusible member adapted to fuse

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<sup>2</sup> SawStop saws are made and sold by SawStop, LLC, a wholly-owned subsidiary of applicant SD3, LLC. Pictures and videos of SawStop saws can be seen on the Internet at [www.sawstop.com](http://www.sawstop.com).

to trigger the reaction system to perform the specified action upon detection of the dangerous condition. Various fusible members are shown in Figures 2-4 and 9-11, and they are discussed throughout the specification, such as in paragraph 35 in the specification as published and on page 11, lines 1-11 in the specification as submitted.

Independent claim 2 describes a cutting machine having a support structure, a cutting tool supported by the support structure, a detection system adapted to detect a dangerous condition, a reaction system adapted to perform a specified action upon detection of the dangerous condition, and a fusible member to trigger the reaction system upon fusing of the fusible member. Claim 2 also requires a firing subsystem to fuse the fusible member upon detection of the dangerous condition. Firing subsystems are discussed in paragraph 36 of the published specification and on page 11, line 12 through page 12, line 3 in the specification as submitted. Exemplary embodiments of firing subsystems are shown in Figures 5-11 and they are discussed throughout the specification, such as in paragraphs 54-55 of the published specification, which corresponds to page 18, line 10 through page 19, line 12 in the specification as submitted.

Independent claim 21 describes a cutting machine having a cutting tool and a detection system adapted to detect contact between a person and the cutting tool. The cutting machine also includes a brake system including a brake pawl adapted to engage and stop the cutting tool when the detection system detects contact between a person and the cutter (such as brake pawl 60 shown in Figures 2, 10 and 11). The brake system also includes a release mechanism adapted to selectively restrain the brake pawl from engaging the cutter until the detection system detects contact between the

person and the cutter, and the release mechanism includes a fuse wire that is melted upon detection of contact between the person and the cutter. A release mechanism is shown schematically at 34 in Figure 1. Release mechanisms are discussed at various locations in the specification, including paragraph 36 of the specification as published and page 11, line 12 through page 12, line 3 in the specification as submitted.

Independent claim 26 describes a cutting machine having a cutter and a brake adapted to stop the cutter, where the brake has an idle position and a braking position. The cutting machine also includes an actuation system adapted to selectively move the brake from the idle position to the braking position, where at least a portion of the actuation system must be replaced after moving the brake from the idle position to the braking position. Paragraph 37 in the specification as published, which corresponds to page 12, lines 4-20 in the specification as submitted, discusses the replacement of one or more portions of an actuation system.

Independent claim 34 describes a cutting machine with several means-plus-function limitations. The machine includes cutting means for cutting a workpiece. The structure, material or acts described in the specification as corresponding to the recited function includes cutting tool 14 shown schematically in Figure 1 and blade 40 shown in Figures 2 and 3. The machine also includes detection means for detecting a dangerous condition between the cutting means and a person. The structure, material or acts described in the specification as corresponding to the recited function include detection subsystem 22 shown schematically in Figure 1 and the various detection systems identified above in connection with claim 1. The machine also includes reaction means for performing a specified action upon detection of the dangerous condition. The

structure, material or acts described in the specification as corresponding to the recited function include reaction subsystem 24 shown schematically in Figure 1 and the various reaction systems identified above in connection with claim 1. The machine also includes fusible means for triggering the reaction means to perform the specified action upon fusing of the fusible means. The structure, material or acts described in the specification as corresponding to the recited function include fusible member 70 and wires 605 and 608 shown in Figures 2-7 and 9-11 and discussed throughout the specification.

**6. Grounds of rejection to be reviewed on appeal.**

The grounds of rejection presented for review are:

- 1) a rejection of claims 1-5, 8-12, 21, 25, 26 and 34 under 35 USC 103(a) as obvious in light of Friemann (US Patent 3,858,095) or Yoneda (US Patent 4,117,752) combined with Baur (US Patent 3,695,116);
- 2) a rejection of claim 13 under 35 USC 103(a) as obvious in light of Friemann or Yoneda combined with Baur and Gaüs (US Patent 4,589,047);
- 3) a rejection of claim 15 under 35 USC 103(a) as obvious in light of Friemann or Yoneda combined with Baur and Gaüs; and
- 4) a rejection of claims 1, 2, 4, 5, 8-15, 21, 25 and 26 under 35 USC 103(a) as obvious in light of Friemann or Yoneda combined with Gaüs.

**7. Argument.****Obviousness under 35 USC 103(a)****I. Claims 1-5, 8-12, 21, 25, 26 and 34 in light of Friemann or Yoneda in view of Baur.****A. Claims 1-5, 9, 10 and 34.**

Claim 1-5, 9, 10 and 34 were rejected under 35 USC 103(a) as obvious in light of Friemann or Yoneda combined with Baur. Friemann discloses a protective circuit for a band cutter machine used in the textile industry. (Friemann, column 1, lines 5-11.) The machine includes a band cutter looped around several wheels. (Friemann, Figure 2.) A motor drives one of the wheels to move the cutter and a user slides a piece of textile past the moving cutter to cut the textile. If during that process the hand of a person contacts the band cutter, then the protective circuit detects that contact and triggers an electromechanical brake and a motor brake to stop the cutter. (Friemann, column 1, lines 45-47, column 3, lines 66-68 & column 4, lines 3-5.) Yoneda also discloses a band cutter and a system to stop the band blade when a human body contacts the blade. (Yoneda, column 1, lines 5-10.) The system includes a clamp brake to grip the sides of the blade and an electromagnetic brake to grip a plate secured to one of the pulleys around which the band blade travels. (Yoneda, column 2, lines 34-41.) Baur discloses an actuator to provide a mechanical force in response to an electrical signal. (Baur, column 1, lines 5-11.) The actuator is made from a "collapsible dual piston assembly." (Baur, column 1, lines 50-51.) The pistons are prevented from collapsing by a pair of shear pins. The shear pins are made from a heat-ignitable material so that when they ignite, they release the pistons and allow them to collapse. (Baur, column 1, lines 51-68.) The examiner says it would have been obvious to combine the band cutter of

Friemann or Yoneda with the actuator of Baur to arrive at the invention set forth in applicant's claims.

The Board should reverse the rejection because: 1) Baur is non-analogous art, 2) Friemann and Yoneda teach away from the invention, 3) there is no reasonable expectation that the combination would succeed, 4) there is no teaching, suggestion or motivation to make the combination, and 5) there are objective indicia of non-obviousness. These points are explained below.

1. Baur is non-analogous art.

The first step in an obviousness analysis is to identify the scope and content of the prior art. Graham v. John Deere Co., 383 U.S. 1, 17, 86 S.Ct. 684, 693-94, 15 L.Ed.2d 545, 148 USPQ 459, 467 (1966). In other words, one must determine what art may be considered. Art that may be considered is called "analogous" while art that may not be considered is called "non-analogous." See In re Clay, 966 F.2d 656, 658, 23 USPQ2d 1058 (Fed. Cir. 1992). Whether a reference is analogous is a question of fact. Id.

The Federal Circuit has identified two criteria for determining whether a reference is analogous. The first is whether the reference is from the same field of endeavor as applicant's invention. If it is, then the reference is analogous. If it is not, then the second criterion must be considered. The second criterion is whether the reference is reasonably pertinent to the particular problem addressed by the inventor. Id. at 658-659.

The Federal Circuit applied these criteria in the case of In re Clay, 966 F.2d 656, 658, 23 USPQ2d 1058 (Fed. Cir. 1992). In that case, the Federal Circuit reversed a rejection of claims to a process for storing liquid hydrocarbon in a tank having a dead

volume between the bottom of the tank and its outlet. *Id.* at 657. The process included the step of placing gel in the dead volume. The claims were rejected in light of two references: Hetherington, which disclosed a petroleum storage tank that used bladders to fill the dead space at the bottom of the tank, and Sydansk, which taught using gel to fill anomalies in underground petroleum formations. Clay argued that Sydansk should not be considered because it was non-analogous art. The Board of Patent Appeals and Interferences, however, ruled that Sydansk was in the same field of endeavor, and therefore analogous, because the gel disclosed in Sydansk "would have a number of applications within the manipulation of the storage and processing of hydrocarbon liquids ... [and that] the gel as taught in Sydansk would be expected to function in a similar manner as the bladders in the Hetherington patent." *Id.* at 659.

Clay then appealed to the Federal Circuit. The first question addressed by the Federal Circuit was whether Sydansk was in the same field of endeavor as Clay. The court ruled that it was not, saying: "Sydansk cannot be considered to be within Clay's field of endeavor merely because both relate to the petroleum industry." *Id.* The court explained that Sydansk dealt with underground formations while Clay dealt with man-made storage tanks, and Sydansk's invention operated at high temperatures and pressures while Clay's invention operated at ambient temperature and atmospheric pressure. Because of these differences, the court ruled that the two references were from different fields of endeavor: "Clay's field of endeavor is the *storage* of refined liquid hydrocarbons. The field of endeavor of Sydansk's invention, on the other hand is the *extraction* of crude petroleum. The Board clearly erred in considering Sydansk to be within the same field of endeavor as Clay's." *Id.* (emphasis in original).

The Federal Circuit then considered the second criterion, whether Sydansk was reasonably pertinent to the problem addressed by Clay, and stated:

A reference is reasonably pertinent if, even though it may be in a different field from that of the inventor's endeavor, it is one which, because of the matter with which it deals, logically would have commended itself to an inventor's attention in considering his problem. Thus, the purposes of both the invention and the prior art are important in determining whether the reference is reasonably pertinent to the problem the invention attempts to solve. If a reference disclosure has the same purpose as the claimed invention, the reference relates to the same problem, and that fact supports use of that reference in an obviousness rejection. An inventor may well have been motivated to consider the reference when making his invention. If it is directed to a different purpose, the inventor would accordingly have had less motivation or occasion to consider it. (Id. at 659)

The Federal Circuit applied that standard and explained that the purpose of Clay's invention was to displace liquid from dead spaces in a storage tank while the purpose of Sydansk's invention was to recover oil from rock. The court also explained that a subterranean formation "is not structurally similar to, does not operate under the same temperature and pressure as, and does not function like Clay's storage tanks." Id. at 660. Because of these differences the court concluded that Sydansk was not reasonably pertinent to the problem addressed by Clay, and therefore, Sydansk was non-analogous and should not have been considered.

The situation in Clay is similar to the case at hand. Applicant's field of endeavor is safety systems for cutting machines while Baur's field of endeavor is actuators. (Baur, column 1, lines 5-7.) Safety systems for cutting machines and actuators address different issues, operate under different principles, serve different purposes, and are constructed differently. These differences are greater than the differences between storing and extracting petroleum described in Clay, and they show that applicant's

invention and Baur are from different fields of endeavor. Thus, the question becomes whether Baur is reasonably pertinent to the problem addressed by applicant.

Baur is not reasonably pertinent to the problem addressed by applicant because an inventor considering how to make a cutting machine safer would not look to actuators to solve that problem. Actuators by themselves do not suggest safety systems, and safety systems do not bring to mind actuators. It is only after an inventor conceives of a safety system, and determines that the system requires an actuator, that actuators would become of interest. But that is after the solution to the problem has been conceived, or in other words, after an inventive step has occurred. And even then, not all actuators would be of interest because many actuators would not work with the invented solution.

In Clay, the Federal Circuit ruled that a person considering how to make petroleum storage tanks would not look to petroleum extraction methods because of differences in purpose, structure, and operation, even though the invented petroleum storage tanks and the prior art petroleum extraction method both used gel to fill dead spaces. The Federal Circuit explained: "A person having ordinary skill in the art would not reasonably have expected to solve the problem of dead volume in tanks for storing refined petroleum by considering a reference dealing with plugging underground formation anomalies." In re Clay, 966 F.2d at 660. Similarly, in the case at hand, a person considering how to make cutting machines safer would not reasonably have expected to solve the problem by considering actuators because of differences in purpose, structure and operation, even though the invented solution may end up using an actuator. Again, actuators themselves do not suggest a solution to the problem of

cutting machine safety, and as a result, they are non-analogous. At the very least, heat-ignitable actuators as disclosed in Baur are non-analogous. In fact, the only reason to look to heat-ignitable actuators is because applicant taught how they could be used in a safety system for cutting machines. Prior to applicant's teachings, no one used heat-ignitable actuators in safety systems for cutting machines, as shown by the absence of any reference describing a cutting machine with such an actuator and the absence of any reference explaining how such an actuator could be used in a safety system for a cutting machine. It is only by looking at the problem with hindsight that the relevance of heat-ignitable actuators can be seen, but hindsight does not make a non-analogous reference analogous. See, In re Oetiker, 977 F.2d 1443, 1447, 24 USPQ2d 1443 (Fed. Cir. 1992) (garment fasteners were non-analogous to a fastener for hose clamps because only with hindsight would a person look to garment fasteners when considering hose clamps); In re Pagliaro, 657 F.2d 1219, 1224-1225, 210 USPQ 888 (CCPA 1981) (reference concerning the solubility of caffeine in oil was non-analogous to a process of decaffeinating vegetable materials for beverages because there was no common environment between solubility studies and beverage preparation).

## 2. Friemann and Yoneda teach away from the invention.

Even if Baur were analogous art and could be considered, the obviousness rejection still should be reversed because Friemann and Yoneda teach away from using an actuator as disclosed in Baur. As a general rule, references that teach away from a claimed invention do not support a prima facie case of obviousness. See, e.g., McGinley v. Franklin Sports, Inc., 262 F.3d 1339, 1354, 60 USPQ2d 1001 (Fed. Cir. 2001) ("We have noted elsewhere, as a 'useful general rule,' that references that teach

away cannot serve to create a *prima facie case of obviousness.*" Citation omitted.); *In re Haruna*, 249 F.3d 1327, 1335-1336, 58 USPQ2d 1517 (Fed. Cir. 2001) ("Because Benne teaches away from a final product having a broad transparent outer region, it does not render the claimed design obvious."); *In re Geisler*, 116 F.3d 1465, 1469, 43 USPQ2d 1362 (Fed. Cir. 1997) ("[A] *prima facie case of obviousness can be rebutted if the applicant ... can show 'that the art in any material respect taught away' from the claimed invention.*" Quoting *In re Malagari*, 499 F.2d 1297, 1303, 182 USPQ 549, 553 (CCPA 1974)); *In re Gordon*, 733 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed. Cir. 1984) (inoperable modification teaches away); *In re Sponnoble*, 405 F.2d 578, 587, 160 USPQ 237 (CCPA 1969) (references teach away because the combination "would produce a seemingly inoperative device").

In the case at hand, Friemann and Yoneda teach away from a cutting machine with a fusible member because they both disclose brake systems capable of repeated actuations without the need to change or replace any component. Baur's actuator, in contrast, is a single-use actuator that cannot trigger a brake multiple times. If the brake systems of Friemann or Yoneda were somehow modified to include Baur's actuator, then the resulting brake systems would no longer be capable of repeated actuations. Instead, the brake systems could trigger only once and then the actuator would have to be replaced. Why would a person of ordinary skill think to make that change to a less effective system? What is the motivation to do so? Clearly, by teaching brake systems capable of repeated actuations, Friemann and Yoneda both teach away from using an actuator as disclosed in Baur.

3. There is no reasonable expectation that the combination would succeed.

Another reason the obviousness rejection should be reversed, even if Baur were analogous art and could be considered, is that there is no reasonable expectation that an actuator as disclosed in Baur could be successfully implemented in a band cutter as disclosed in Friemann or Yoneda. The obviousness rejection cannot stand without that reasonable expectation. In re Dow Chemical Co., 837 F.2d 469, 473, 5 USPQ2d (Fed. Cir. 1988) ("The consistent criterion for determination of obviousness is whether the prior art would have suggested to one of ordinary skill in the art that this process should be carried out and would have a reasonable likelihood of success, viewed in the light of the prior art."); see also MPEP 2143.02 ("Reasonable Expectation of Success Is Required").

Baur shows an actuator made from a "collapsible dual piston assembly." (Baur, column 1, lines 50-51.) The pistons are prevented from collapsing by a pair of shear pins. The shear pins are made from a heat-ignitable material so that when they ignite, they release the pistons and allow them to collapse. (Baur, column 1, lines 51-68.) Figure 7 in Baur shows how the actuator may be used. A pair of springs 58 in a housing 55 push on pivotable latches 62 and an actuator 50 prevents the latches from pivoting until the shear pins are ignited. When the shear pins are ignited, the actuator collapses under the force of the springs. That collapse can be used to initiate some mechanical device. In contrast, the electromechanical brakes of Friemann and Yoneda energize a wire coil or solenoid to create an electromagnetic force and that force moves an armature into contact with a braking surface. Friction between the armature and braking surface causes the braking. A continuous current is required to energize the coil to

create the electromagnetic force, but a heat-ignitable actuator like the one disclosed in Baur does not apply or trigger a continuous electrical current, so there is no likelihood that such an actuator could trigger an electromechanical brake as disclosed in Friemann and Yoneda. Moreover, there is no reason to incorporate a heat-ignitable actuator as disclosed in Baur into a brake system as disclosed in Friemann and Yoneda because an electromechanical brake is triggered electrically, not mechanically. In other words, a heat-ignitable actuator could not replace an electromechanical brake because it could not apply the required braking force, and there is no way for a heat-ignitable actuator to trigger an electromechanical brake because the brake is triggered when electric current energizes the coil to create the electromagnetic force. As a result, there is no reasonable expectation that an actuator as disclosed in Baur could be used in band cutters as disclosed in Friemann or Yoneda.

The examiner responded to this point by saying: "[T]he test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art." (Final Office Action mailed 9/22/05, p. 10, citing In re Keller, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).) The examiner misunderstands applicant's point. Applicant is not saying that the specific actuator of Baur must be bodily incorporated into the structure of Friemann or Yoneda. Rather, applicant is saying that actuators like the one disclosed in Baur do not work with and are superfluous to electromechanical brakes like those

disclosed in Friemann and Yoneda that require an electromagnetic force to move an armature into contact with a braking surface.

Additionally, applicant is saying that the cited references fail to enable a system as claimed by applicant. There simply is no teaching in any cited reference explaining how to implement an actuator as disclosed in Baur into band cutters as disclosed in Friemann or Yoneda. This is significant because, in order to support an obviousness rejection, the cited references "must provide an enabling disclosure, i.e., [it] must place the claimed invention in the possession of the public. ... An invention is not 'possessed' absent some known or obvious way to make it." In re Payne, 606 F.2d 303, 314, 203 USPQ 245, 255 (CCPA 1979) (citations omitted); see also In re Kumar, 418 F.3d 1361, 1369, 76 USPQ2d 1048 (Fed. Cir. 2005) ("To render a later invention unpatentable for obviousness, the prior art must enable a person of ordinary skill in the field to make and use the later invention."); Motorola, Inc. v. Interdigital Technology Corp., 121 F.3d 1461, 1471, 43 USPQ2d 1481 (Fed. Cir. 1997) (district court correctly instructed the jury that prior art must be enabling to invalidate claims as obvious); Beckman Instruments, Inc. v. LKB Produkter AB, 892 F.2d 1547, 1551, 13 USPQ2d 1301, 1304 (Fed. Cir. 1989) ("In order to render a claimed apparatus or method obvious, the prior art must enable one skilled in the art to make and use the apparatus or method.")

4. There is no teaching, suggestion or motivation to make the combination.

Perhaps the most important reason the obviousness rejection should be reversed, assuming Baur were analogous art and could be considered, is that there is no teaching, suggestion or motivation in the prior art to combine Friemann or Yoneda with Baur. Without such a teaching, suggestion or motivation, the obviousness rejection

cannot stand. In re Rouffet, 149 F.3d 1350, 1355, 47 USPQ2d 1453 (Fed. Cir. 1998). Additionally, the suggestion to combine references "must be founded in the prior art, not in the applicant's disclosure." In re Vaeck, 947 F.2d 488, 493, 20 USPQ2d 1438 (Fed. Cir. 1991).

The examiner said the motivation to combine references was "to create less expensive, smaller and fast acting braking systems." (Final Office Action mailed 9-22-05, p. 3.) That is the only motivation identified by the examiner to make the combination. However, applicant is unaware of any teaching or suggestion in the cited references supporting that conclusion. In fact, the opposite conclusion seems more likely. For example, the dual-piston structure and the heat-ignitable material used in Baur's actuators would likely cause those actuators to be more expensive than the standard wire coils or solenoids used to trigger the brakes disclosed in Friemann and Yoneda, especially over the long term where Baur's actuators would have to be replaced after each use. Baur's actuators would also be additional to, not a replacement for, the wire coils or solenoids of Friemann and Yoneda because Baur's actuator could not supply the electromagnetic force required to operate the brakes of Friemann and Yoneda. Adding Baur's actuator would also likely result in a larger overall system given the fact that Baur's actuators require additional structure in order for the actuator to trigger some action, as shown in Figures 7 and 8 of Baur. The only example given by Baur as to the speed at which his actuator works is that the dual-pistons may collapse within 40 milliseconds when subjected to a biasing force of 80 pounds. (Baur, column 5, lines 21-24.) There is no evidence showing that 40 milliseconds is faster than energizing coils like those in the electromechanical brakes disclosed in Friemann and Yoneda. Thus, the

examiner's statement that the combination of Friemann or Yoneda with Baur would result in cheaper, smaller and faster brake systems is unsupported.

A specific and clear suggestion to combine references is required to support an obviousness rejection, not simply an unsupported statement that the combination would be cheaper, smaller and faster. This is explained by the case of In re Rouffet, 149 F.3d 1350, 1355, 47 USPQ2d 1453 (Fed. Cir. 1998). In that case the Board of Patent Appeals and Interferences affirmed the rejection of an application concerning a satellite communication system. The application addressed the problem of how to keep a receiver on the earth in communication with a satellite moving around the earth. Typically, a satellite transmits multiple signal beams to the earth and a receiver must switch from one beam to another as the satellite moves. This switching from beam to beam is referred to as a handover, and a disruption in communication is more likely during a handover. Rouffet minimized the number of handovers required by changing the shape of the transmitted beams from cones to fans. Fan-shaped beams have elliptical footprints that extend parallel to the direction of a satellite's motion. The elliptical footprints help ensure that a fixed point on the earth will remain within the satellite's beam. Id. at 1353.

The examiner rejected Rouffet's claims as obvious in light of a patent to King, a patent to Rosen, and a conference report by Ruddy. King disclosed a system to launch a plurality of low-orbit satellites. Rosen disclosed a geostationary satellite using fan-shaped beams oriented in an east-west direction. Ruddy disclosed a television broadcast system that transmitted a single fan-shaped beam upward from the earth into which satellites would successively enter. This fan-shaped beam was oriented so its

long axis was aligned with the long axes of the satellites' orbits. Id. at 1356. The Board affirmed the examiner's rejection and added an alternative rejection based on the combination of two other patents. Rouffet then appealed to the Federal Circuit.

On appeal, the Federal Circuit found no error in the Board's conclusion that "the combination of King, Rosen, and Ruddy contains all of the elements claimed in Rouffet's application." Id. at 1357. Nevertheless, the Federal Circuit concluded "the Board reversibly erred in determining that one of skill in the art would have been motivated to combine these references in a manner that rendered the claimed invention obvious." Id. The Federal Circuit said the Board erred by failing to identify any specific understanding or scientific principle suggesting the combination. The court explained that an examiner cannot simply find claim elements in the prior art and then combine them to arrive at the invention because such an approach would allow hindsight to influence the determination. Rather, an examiner must find the claim elements in the prior art and then specify how the prior art suggests or motivates the combination of those elements. This is explained in the following discussion from Rouffet:

As this court has stated, "virtually all [inventions] are combinations of old elements." *Environmental Designs, Ltd. v. Union Oil Co.*, 713 F.2d 693, 698, 218 U.S.P.Q. 865, 870 (Fed. Cir. 1983); see also *Richdel, Inc. v. Sunspool Corp.*, 714 F.2d 1573, 1579-80, 219 U.S.P.Q. 8, 12 (Fed. Cir. 1983) ("Most, if not all, inventions are combinations and mostly of old elements.") Therefore an examiner may often find every element of a claimed invention in the prior art. If identification of each claimed element in the prior art were sufficient to negate patentability, very few patents would ever issue. Furthermore, rejecting patents solely by finding prior art corollaries for the claimed elements would permit an examiner to use the claimed invention itself as a blueprint for piecing together elements in the prior art to defeat the patentability of the claimed invention. Such an approach would be "an illogical and inappropriate process by which to determine patentability." *Sensonics*,

*Inc. v. Aerosonic Corp.*, 81 F.3d 1566, 1570, 38 U.S.P.Q.2d 1551, 1554 (Fed. Cir. 1996).

To prevent the use of hindsight based on the invention to defeat patentability of the invention, this court requires the examiner to show a motivation to combine the references that create the case of obviousness. In other words, the examiner must show reasons that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references for combination in the manner claimed.

This court has identified three possible sources for a motivation to combine references: the nature of the problem to be solved, the teachings of the prior art, and the knowledge of persons of ordinary skill in the art. In this case, the Board relied upon none of these. Rather, just as it relied on the high level of skill in the art to overcome the differences between the claimed invention and the selected elements in the references, it relied upon the high level of skill in the art to provide the necessary motivation. The Board did not, however, explain what specific understanding or technological principle within the knowledge of one of ordinary skill in the art would have suggested the combination. Instead, the Board merely invoked the high level of skill in the field of art. If such a rote invocation could suffice to supply a motivation to combine, the more sophisticated scientific fields would rarely, if ever, experience a patentable technical advance. Instead, in complex scientific fields, the Board could routinely identify the prior art elements in an application, invoke the lofty level of skill, and rest its case for rejection. To counter this potential weakness in the obviousness construct, the suggestion to combine requirement stands as a critical safeguard against hindsight analysis and rote application of the legal test for obviousness.

Because the Board did not explain the specific understanding or principle within the knowledge of a skilled artisan that would motivate one with no knowledge of Rouffet's invention to make the combination, this court infers that the examiner selected these references with the assistance of hindsight. This court forbids the use of hindsight in the selection of references that comprise the case of obviousness. See *In re Gorman*, 933 F.2d 982, 986, 18 U.S.P.Q.2d 1885, 1888 (Fed.Cir.1991). Lacking a motivation to combine references, the Board did not show a proper *prima facie* case of obviousness. This court reverses the rejection over the combination of King, Rosen, and Ruddy. (Rouffet, 149 F.3d at 1357-1358.)

This discussion is pertinent to the case at hand because the examiner in the present application did not identify any specific understanding or technological principle

that would motivate a person of ordinary skill to modify a band cutter as disclosed in Friemann or Yoneda to include an actuator as disclosed in Baur, just as the examiner in Rouffet failed to identify any such understanding or principle. As stated, the examiner in the case at hand simply said it would have been obvious to combine the references to create a cheaper, smaller and faster braking system. (Final Office Action mailed 9/22/05, p. 3.) That is simply a rote invocation used to justify the combination of references, just as the reliance on a high level of skill was a rote invocation used to justify the combination of references in Rouffet. As explained by the Federal Circuit, such rote invocations cannot provide the required motivation because then there would rarely be any patentable technical advance. Instead, a specific suggestion to make a combination is required because, as the Federal Circuit has said, "invention itself is the process of combining prior art in a nonobvious manner." Id. at 1359. In the case at hand, the examiner failed to identify any specific suggestion to make the combination.

It is important to understand that the mere existence of a heat-ignitable actuator as disclosed in Baur does not mean it would have been obvious to use such an actuator in a machine as set forth in applicant's claims. The cited references make no such suggestion. In fact, the cited references fail to even identify a need for such an actuator in a system that employs electromechanical brakes. The only teaching or suggestion to use a fusible member to trigger a reaction system in a cutting machine is found in applicant's teachings. If one has not reviewed applicant's disclosure, there would be no reason to include a fusible member in a cutting machine to trigger some action in response to the detection of a dangerous condition; one would use systems like those disclosed in Friemann or Yoneda instead. In an obviousness analysis, however, one

must review the prior art without the benefit of applicant's disclosure. One cannot use the teaching of applicant's disclosure to suggest the modification to the prior art.

This is explained by the case of In re Dembiczak, 175 F.3d 994, 999, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999) (citations omitted), abrogated on other grounds in In re Gartside, 203 F.3d 1305, 53 USPQ2d 1769 (Fed. Cir. 2000). In that case the Board of Patent Appeals and Interferences affirmed the rejection of an application concerning a trash bag made to look like a jack-o'-lantern when filled with leaves or trash. The application was rejected in light of conventional plastic trash bags combined with orange crepe paper jack-o'-lanterns (referred to as the Holiday reference) and paper bag pumpkins (referred to as the Shapiro reference). The Federal Circuit reversed the rejection because the Board used hindsight to combine references instead of identifying a specific suggestion to make the combination. The Federal Circuit explained:

Measuring a claimed invention against the standard established by section 103 requires the oft-difficult but critical step of casting the mind back to the time of invention, to consider the thinking of one of ordinary skill in the art, guided only by the prior art references and the then-accepted wisdom in the field. See, e.g., *W.L. Gore & Assocs., Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1553, 220 USPQ 303, 313 (Fed. Cir. 1983). Close adherence to this methodology is especially important in the case of less technologically complex inventions, where the very ease with which the invention can be understood may prompt one "to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher."

Our case law makes clear that the best defense against the subtle but powerful attraction of a hindsight-based obviousness analysis is rigorous application of the requirement for a showing of the teaching or motivation to combine prior art references. [Citations omitted.] Combining prior art references without evidence of such a suggestion, teaching, or motivation simply takes the inventor's disclosure as a blueprint for piecing together the prior art to defeat patentability – the

essence of hindsight. [Citation omitted.] In this case, the Board fell into the hindsight trap. (Dembiczak, 175 F.3d at 999.)

Just as in Dembiczak, the examiner in the case at hand “fell into the hindsight trap.” Id. It is only by looking at applicant’s disclosure that one learns to incorporate a fusible member to trigger a reaction system in a cutting machine; the cited references do not suggest that combination.

A factor that may be considered in determining whether the prior art suggests a particular combination is whether the combination would change the principle of operation of the device being modified. If it would, then there is no suggestion to make the combination. This is explained by the case of In re Ratti, 270 F.2d 810, 123 USPQ 349 (CCPA 1959). In that case, claims directed to an oil seal comprising a bore engaging portion with a resilient sealing member were rejected as obvious in light of a combination of references, including a primary reference with a more rigid seal. The court reversed the rejection, explaining that the “suggested combination of references would require a substantial reconstruction and redesign of the elements shown in [the primary reference] as well as a change in the basic principle under which the [primary reference] construction was designed to operate.” Id. at 813, 123 USPQ at 352.

Ratti is analogous to the case at hand because the proposed combination of Friemann or Yoneda with Baur would change the basic principle of operation of the disclosed band cutters. As stated, Friemann and Yoneda both operate on the principle that the brake systems may be operated repeatedly. If the brake system of Friemann or Yoneda could somehow be modified to include Baur’s actuator, then the resulting brake system would no longer be capable of repeated actuations. Instead, the brake system

could trigger only once and then the actuator would have to be replaced. That is a change in the principle of operation of the brake systems disclosed in Friemann and Yoneda, and that change supports the conclusion that there is no suggestion to make the combination, just as similar facts showed there was no suggestion to combine references in Ratti.

5. There are objective indicia of non-obviousness.

Another factor showing that a cutting machine as described in claim 1 would not have been obvious is the existence of objective indicia of non-obviousness. Applicant submitted a declaration of Stephen F. Gass setting forth objective evidence of non-obviousness. That declaration cited statistics from the U.S. Consumer Product Safety Commission showing there are tens of thousands of people severely injured with power saws every year in the United States. The number of those injuries clearly shows there has been a long felt but unsatisfied need for safer cutting machines. The fact that others have tried to make safer cutting machines is shown by the Friemann and Yoneda patents. Despite the fact that others have tried to develop safer cutting machines, the annual number of injuries has stayed essentially the same, showing that the attempts to satisfy the need have failed. The existence of a long-felt need, and the failure of others to satisfy that need, supports the conclusion that applicant's claims are non-obvious.

Applicant also submitted a Second Declaration of Dr. Stephen F. Gass to introduce additional objective evidence of non-obviousness. Part of the additional evidence is a notice filed with the Department of Justice, Antitrust Division, pursuant to the National Cooperative Research and Production Act of 1993, by The Black & Decker Corp., Hitachi Koki, U.S.A., Ltd., Pentair Tools Group, Robert Bosch Tool Corporation,

and Ryobi Technologies, Inc. The notice was published December 1, 2003, and it says those companies have entered into a joint venture to research and develop "technology for power saw blade contact injury avoidance, including skin sensing systems, blade braking systems, and/or blade guarding systems." A copy of the notice is attached to the Second Declaration of Dr. Stephen F. Gass. This notice is further evidence that others have been and are continuing to address the need for safer saws.

Another part of the additional evidence submitted with the Second Declaration of Dr. Stephen F. Gass is a report from the U.S. Consumer Product Safety Commission showing that the total cost to society from injuries involving bench and table saws is \$2 billion annually. This evidence further establishes that there has been a long-felt but unsatisfied need for safer saws.

Further evidence of non-obviousness includes awards and media coverage received by applicant's technology. These awards are identified in the two declarations and they include:

- Chairman's Commendation. The U.S. Consumer Product Safety Commission awarded the technology a Chairman's Commendation for significant contributions to product safety. That award was reported nationally on CNN Headline News.
- Challenger's Award. At an International Woodworking Fair in Atlanta, Georgia, the technology won the Challenger's Award, which is the woodworking industry's highest honor. It recognizes the most innovative and technically advanced improvements to woodworking equipment.

- Popular Science – One of the 100 Best New Innovations. The magazine *Popular Science* identified the technology as one of the 100 best new innovations of 2002.
- Workbench Magazine – One of the Top 10 Tools for 2003. *Workbench* magazine included the saws incorporating the technology on its list of the top 10 innovative tools for 2003.
- Woodwork Institute of California Endorsement. The Woodwork Institute of California has endorsed the technology, stating:

As a Trade Association in the construction industry (representing over 250 manufacturers of architectural millwork with an excess of 4,000 employees, all of whom use saws of one type or another) we find your SawStop technology and its potential of eliminating or reducing worker injury of extreme significance. Generally, we would not endorse a commercial product; however the potential benefit to our members and their employees of implementing the SawStop technology on the tools used within our industry overrides such.

- Editor's Choice Award, Tools of the Trade. The magazine *Tools of the Trade* awarded the technology its 2001 Editor's Choice Award in recognition of its significance.
- 2005 Reader's Choice Award, *Woodshop News*. This award is given to a new tool or machine that has significantly increased productivity or quality of work.

Dr. Gass also explained in his second declaration that saws constructed as claimed in the present application have saved the hands of at least 10 people from serious injury when their hands accidentally contacted the spinning blade of the saw. The number of saves has now increased to at least 31. These people include high school students, university students, cabinet shop workers, hobbyists, and one blind woodworker. The fact that the technology claimed in the present application has saved

numerous people from what otherwise could have been life-changing injuries is further evidence that the claims are not obvious.

B. Claim 8.

Claim 8 was rejected as obvious in light of Friemann or Yoneda combined with Baur. Claim 8 depends from claim 2 and is not obvious for the same reasons that claim 2 is not obvious. Claim 8 also specifies that "the fusible member is held in tension." Baur fails to disclose this limitation. Instead, Baur discloses fusible shear pins without any indication that the shear pins are held in tension. (Baur, column 1, lines 51-68.) Therefore, the cited references fail to disclose all the limitations of claim 8, and as a result, they cannot support an obviousness rejection of this claim. See, e.g., 35 USC 103(a) (question is whether "the subject matter as a whole would have been obvious"); Application of Royka, 490 F.2d 981, 985 (CCPA 1974) (claim not obvious because limitation missing from cited references); Application of Wilson, 424 F.2d 1382, 1385 (CCPA 1970) ("All words in a claim must be considered in judging the patentability of that claim against the prior art."); MPEP 2143.03 ("To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art.")

C. Claims 11 and 12.

Claims 11 and 12 were also rejected as obvious in light of Friemann or Yoneda combined with Baur. Claims 11 and 12 depend from claims 2 and 9 and are not obvious for the same reasons that those claims are not obvious. Claim 2 defines a cutting machine with detection and reaction systems and with a fusible member to trigger the reaction system. Claim 9 depends from claim 2 and further specifies that the cutting

machine includes "at least two spaced-apart electrodes adapted to conduct electrical current, and where at least a portion of the fusible member is positioned to contact and extend between the electrodes." Claim 11 then specifies that "the spacing between the electrodes is less than 0.1 inch (2.54 millimeters)." Claim 12 specifies that "the spacing between the electrodes is less than 0.05 inch (1.27 millimeters)." These limitations are not disclosed in the cited references. The examiner says these limitations would be within the ordinary skill in the art because they are merely changes in size of a component. (Final Office Action mailed 9/22/05, p. 4.) That is incorrect. These limitations affect how quickly and easily the fusible member can fuse, as shown in Figure 13 and the accompanying text from applicant's specification. There is no teaching or statement in any cited reference suggesting that the spacing between electrodes could be selected to affect how the fusible member fuses. Accordingly, these limitations further distinguish the cited references and these claims are not obvious because of these limitations. See, e.g., 35 USC 103(a) (question is whether "the subject matter as a whole would have been obvious"); Application of Royka, 490 F.2d 981, 985 (CCPA 1974) (claim not obvious because limitation missing from cited references); Application of Wilson, 424 F.2d 1382, 1385 (CCPA 1970) ("All words in a claim must be considered in judging the patentability of that claim against the prior art."); MPEP 2143.03 ("To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art.")

D. Claim 21.

Claim 21 was also rejected as obvious in light of Friemann or Yoneda combined with Baur. Claim 21 is an independent claim and it is not obvious in light of the cited

references for the same reasons given above concerning claim 1. Additionally, claim 21 says its brake system includes "a brake pawl adapted to engage and stop the cutting tool when the detection system detects contact between the person and the cutter." The cited references fail to disclose a brake pawl. Claim 21 also says its brake system includes "a release mechanism adapted to selectively restrain the brake pawl from engaging the cutter until the detection system detects contact between the person and the cutter." The cited references fail to show a release mechanism to restrain the brake pawl. These are additional reasons why claim 21 is not obvious in light of the cited references. See, e.g., 35 USC 103(a) (question is whether "the subject matter as a whole would have been obvious"); Application of Royka, 490 F.2d 981, 985 (CCPA 1974) (claim not obvious because limitation missing from cited references); Application of Wilson, 424 F.2d 1382, 1385 (CCPA 1970) ("All words in a claim must be considered in judging the patentability of that claim against the prior art."); MPEP 2143.03 ("To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art.")

#### E. Claims 25 and 26.

Claims 25 and 26 were also rejected as obvious in light of Friemann or Yoneda combined with Baur. Claim 25 is an independent claim and claim 26 depends from claim 25. Claims 25 and 26 are not obvious in light of the cited references for the same reasons given above concerning claim 1. Additionally, claims 25 and 26 recite "an actuation system adapted to selectively move the brake from the idle position to the braking position, where at least a portion of the actuation system must be replaced after moving the brake from the idle position to the braking position." Claim 26 also says "the

actuation system includes a fusible member that is melted to allow the brake to move from the idle position to the braking position." The cited references do not teach or suggest that limitation. This is another reason claims 25 and 26 are not obvious in light of the cited references. See, e.g., 35 USC 103(a) (question is whether "the subject matter as a whole would have been obvious"); Application of Royka, 490 F.2d 981, 985 (CCPA 1974) (claim not obvious because limitation missing from cited references); Application of Wilson, 424 F.2d 1382, 1385 (CCPA 1970) ("All words in a claim must be considered in judging the patentability of that claim against the prior art."); MPEP 2143.03 ("To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art.")

II. Claim 13 in light of Friemann or Yoneda in view of Baur and Gaüs.

Claim 13 was rejected under 35 USC 103(a) as obvious in light of Friemann or Yoneda combined with Baur and Gaüs (US Patent 4,589,047). Claim 13 depends from claims 2 and 9 and the rejection of claim 13 should be reversed for the same reasons that the rejection of claims 2 and 9 should be reversed.

This rejection also should be reversed because Gaüs is non-analogous art. Gaüs discloses a switch to protect the user of small electric appliances such as "portable hair dryers, portable air heaters (fan-forced), sunlamps, 'irradiation lamps', electric shavers, etc." from electric shock if the appliance is exposed to water or other electrically conductive fluid. (Gaüs, column 1, lines 11-27 and column 2, lines 55-66.) Gaüs is non-analogous because it is from a field of endeavor different than applicant's invention, namely, the field of protecting a user of a small appliance from electric shock if the appliance is exposed to water. Gaüs is not reasonably pertinent to safety systems for

cutting machines because an inventor considering how to make cutting machines safer would not look to shock-protection systems for small appliances. Those are different problems that involve different devices and that require different solutions. Additionally, the structure and operation of a cutting machine is different than the structure and operation of a small appliance or a shock-protection mechanism as disclosed in Gaüs. These differences are at least as significant as the differences between petroleum storage tanks and petroleum extraction methods described in In re Clay, 966 F.2d 656, 658, 23 USPQ2d 1058 (Fed. Cir. 1992). See also, In re Oetiker, 977 F.2d 1443, 1447, 24 USPQ2d 1443 (Fed. Cir. 1992) (garment fasteners were non-analogous to a fastener for hose clamps because only with hindsight would a person look to garment fasteners when considering how to fasten a hose clamp); In re Pagliaro, 657 F.2d 1219, 1224-1225, 210 USPQ 888 (CCPA 1981) (reference concerning the solubility of caffeine in oil was non-analogous to a process of decaffeinating vegetable materials for beverages because there was no common environment between solubility studies and beverage preparation).

Even if Gaüs were analogous and could be considered, the rejection still should be reversed because the cited references fail to disclose all the limitations of claim 13. Claim 13 requires at least a portion of the fusible member to contact and extend between electrodes, and the claim specifies that "the electrodes are traces on a circuit board." The examiner rejected the claim by saying:

[T]he examiner takes official notice of the use of electrode traces on circuit boards for the purpose of smaller and more compact device as taught e.g. by Gaiis et al. [sic] Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to use a circuit board for mounting the actuation device of the modified

devices of Friemann et al., Yoneda, and in order to reduce the overall size of the actuator. (Final Office Action mailed 9/22/06, p. 4.)

The examiner is incorrect. Nothing in Gaüs, or any other cited reference, suggests using traces on a circuit board as electrodes to fuse a fusible member and thereby trigger a reaction system to perform a specified action. To the contrary, Gaüs shows a fusible wire 10 wound to pins 38 and 39 – the fusible wire does not contact traces. Accordingly, the rejection should be reversed. See, e.g., 35 USC 103(a) (question is whether "the subject matter as a *whole* would have been obvious"); Application of Royka, 490 F.2d 981, 985 (CCPA 1974) (claim not obvious because limitation missing from cited references); Application of Wilson, 424 F.2d 1382, 1385 (CCPA 1970) ("All words in a claim must be considered in judging the patentability of that claim against the prior art."); MPEP 2143.03 ("To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art.")

### III. Claim 15 in light of Friemann or Yoneda in view of Baur and Gaüs.

Claim 15 was rejected under 35 USC 103(a) as obvious in light of Friemann or Yoneda combined with Baur and Gaüs. Claim 15 depends from claim 2 and further specifies that the firing subsystem includes at least one silicon controlled rectifier. Claim 15 is not obvious for the same reasons claim 2 is not obvious. Additionally, Gaüs is non-analogous art, as explained. Furthermore, the only suggestion identified by the examiner to combine Baur and Gaüs is "to facilitate the triggering of the actuator." (Final Office Action mailed 9/22/06, p. 5.) That statement, however, is circular. It says it would have been obvious to use an SCR to fuse a fusible member simply because an SCR

will "facilitate" fusing. Such a statement does not constitute the required suggestion.

See In re Rouffet, 149 F.3d 1350, 1355, 47 USPQ2d 1453 (Fed. Cir. 1998).

IV. Claims 1, 2, 4, 5, 8-15, 21, 25 and 26 in light of Friemann or Yoneda and Gaüs.

Claim 1, 2, 4, 5, 8-15, 21, 25 and 26 were rejected under 35 USC 103(a) as obvious in light of Friemann or Yoneda combined with Gaüs. The Examiner says Friemann and Yoneda disclose cutting machines with detection systems to detect dangerous conditions and reaction systems to perform a specified action upon detection of a dangerous condition, but the Examiner recognizes that they do not disclose a fusible member or a firing subsystem. The Examiner says Gaüs "discloses that it is old and well known in the art to use switching devices comprised of spring biased actuators with firing subsystems that are electrically responsive by tensioned wires for the purpose of providing fast acting, less expensive, and smaller devices that provide large mechanical forces," and "[t]herefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to replace the electromagnetic/solenoid actuators of Friemann et al., and Yoneda with spring loaded actuators with firing subsystems, as taught by Gaiis et al. [sic], in order to create less expensive, smaller and fast acting braking systems." (Final Office Action mailed 9/22/06, p. 6.)

The Board should reverse the rejection because Gaüs is non-analogous and should not be considered, because Friemann and Yoneda teach away from the invention, and because there are objective indicia of non-obviousness, as explained above. Gaüs also fails to disclose the spacings recited in claims 10-12, the traces recited in claim 13, the brake pawl and release mechanism recited in claim 21, or the actuation system recited in claims 25 and 26. The Board also should reverse this

rejection because there is no reasonable expectation that the combination would succeed and because there is no teaching, suggestion or motivation to make the combination. These last two points are explained below.

1. There is no reasonable expectation that the combination would succeed.

Gaüs shows a small wire 10 wound around pins 38 and 39, and a spring clip 35 is held by the wire. Friemann and Yoneda, in contrast, energize a wire coil to create an electromagnetic force to move an armature into contact with a braking surface. A continuous current is required to energize the coil to create the electromagnetic force, but a mechanism as disclosed in Gaüs does not apply or trigger a continuous current, so one could not replace the electromagnetic/solenoid actuators of Friemann and Yoneda with the device disclosed in Gaüs. Moreover, there is no reason to incorporate a mechanism as disclosed in Gaüs into a brake system as disclosed in Friemann and Yoneda because an electromechanical brake is triggered electrically, not mechanically. In other words, Gaüs could not replace an electromechanical brake because Gaüs could not apply the required braking force, and there is no need for Gaüs to trigger the electromechanical brake because the brake is triggered when current energizes the coil to create the electromagnetic force. Furthermore, Gaüs' system is designed to trigger upon an undesired increase in current flow, not upon detection of a dangerous condition between a person and a blade or cutting tool. Nothing in Gaüs suggests that its system could be modified to trigger upon detection of a dangerous condition between a person and the blade. These facts show there is no reasonable expectation that the combination of Friemann or Yoneda with Gaüs would succeed.

2. There is no teaching, suggestion or motivation to make the combination.

The only suggestion identified by the examiner to combine references was "to create less expensive, smaller and fast acting braking systems." (Final Office Action mailed 9-22-05, p. 3.) This is the same suggestion given by the examiner to support the rejection of claims based on the combination of Friemann, Yoneda and Baur. Applicant is unaware of any support for that suggestion. To the contrary, adding the protective mechanism disclosed in Gaüs to the band cutter disclosed in Friemann or Yoneda - assuming it could be done - would increase the expense of the band cutter over time because the protective mechanism is a single-use device that would have to be replaced after each actuation. Additionally, the protective mechanism disclosed in Gaüs would be additional to, not a replacement for, the wire coils of Friemann and Yoneda because Gaüs' mechanism cannot supply the electromagnetic force necessary to operate the brakes of Friemann and Yoneda. Adding Gaüs' mechanism would also likely result in a larger overall system given that Gaüs' mechanism would require additional structure. Finally, the addition of Gaüs' mechanism to the band cutter disclosed in Friemann or Yoneda would not result in a faster system because, as explained, Gaüs' mechanism would be additional to the wire coils of Friemann and Yoneda. Thus, the examiner's statement that the combination of Friemann or Yoneda with Gaüs would result in cheaper, smaller and faster brake systems is unsupported.

As explained previously, the examiner's suggestion is simply a rote invocation used to justify the combination of references, and that is improper. In re Rouffet, 149 F.3d 1350, 1357-1358, 47 USPQ2d 1453 (Fed. Cir. 1998). If one has not reviewed applicant's disclosure, there would be no reason to include a fusible member in a cutting

machine to trigger some action in response to the detection of a dangerous condition; one would use systems like those disclosed in Friemann or Yoneda instead. In an obviousness analysis, however, one must review the prior art without the benefit of applicant's disclosure. One cannot use the teaching of applicant's disclosure to suggest the modification to the prior art. In re Dembiczak, 175 F.3d 994, 999, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999) (citations omitted), abrogated on other grounds in In re Gartside, 203 F.3d 1305, 53 USPQ2d 1769 (Fed. Cir. 2000).

Finally, using the device of Gaüs in the systems of Friemann or Yoneda, if it were possible to do so, would change the principle of operation of Friemann and Yoneda from systems capable of multiple actuations to single-use systems, and that is improper. In re Ratti, 270 F.2d 810, 813, 123 USPQ 349 (CCPA 1959).

**8. Claims appendix.**

1. A cutting machine comprising:
  - a blade configured to cut a workpiece;
  - a detection system configured to detect a dangerous condition between a person and the blade;
  - a reaction system adapted to perform a specified action to mitigate possible injury from the dangerous condition; and
  - a fusible member adapted to fuse to trigger the reaction system to perform the specified action upon detection of the dangerous condition.
  
2. A cutting machine comprising:
  - a support structure;
  - a cutting tool adapted to cut a workpiece, where the cutting tool is supported by the support structure;
  - a detection system adapted to detect a dangerous condition between the cutting tool and a person;
  - a reaction system adapted to perform a specified action upon detection of the dangerous condition;
  - a fusible member to trigger the reaction system to perform the specified action upon fusing of the fusible member; and
  - a firing subsystem to fuse the fusible member upon detection of the dangerous condition.

3. The machine of claim 2, where the dangerous condition is contact between the person and the blade.

4. The machine of claim 2, where the reaction system is a brake mechanism and where the specified action is to decelerate the blade.

5. The machine of claim 2, where the fusible member is wire.

6. (withdrawn) The machine of claim 5, where the wire has a diameter of less than 0.025 inch.

7. (withdrawn) The machine of claim 5, where the wire has a diameter of less than 0.015 inch.

8. The machine of claim 2, where the fusible member is held in tension.

9. The machine of claim 2, where the firing subsystem includes at least two spaced-apart electrodes adapted to conduct electrical current, and where at least a portion of the fusible member is positioned to contact and extend between the electrodes.

10. The machine of claim 9, where the spacing between the electrodes is less than 1.0 inch (25.4 millimeters).

11. The machine of claim 9, where the spacing between the electrodes is less than 0.1 inch (2.54 millimeters).

12. The machine of claim 9, where the spacing between the electrodes is less than 0.05 inch (1.27 millimeters).

13. The machine of claim 9, where the electrodes are traces on a circuit board.

14. The machine of claim 2, where the firing subsystem includes at least one capacitor.

15. The machine of claim 2, where the firing subsystem includes at least one silicon controlled rectifier.

16-20. (cancelled)

21. A cutting machine comprising:  
a cutting tool;  
a detection system adapted to detect contact between a person and the cutting tool; and

a brake system including a brake pawl adapted to engage and stop the cutting tool when the detection system detects contact between the person and the cutter;

where the brake system includes a release mechanism adapted to selectively restrain the brake pawl from engaging the cutter until the detection system detects contact between the person and the cutter; and

where the release mechanism includes a fuse wire that is melted upon detection of contact between the person and the cutter.

22-24. (cancelled)

25. A cutting machine comprising:
  - a cutter;
  - a brake adapted to stop the cutter, where the brake has an idle position and a braking position; and
  - an actuation system adapted to selectively move the brake from the idle position to the braking position, where at least a portion of the actuation system must be replaced after moving the brake from the idle position to the braking position.
26. The machine of claim 25, wherein the actuation system includes a fusible member that is melted to allow the brake to move from the idle position to the braking position.
- 27-33. (cancelled)
34. A cutting machine comprising:
  - a support structure;
  - cutting means for cutting a workpiece, where the cutting means is supported by the support structure;
  - detection means for detecting a dangerous condition between the cutting means and a person;
  - reaction means for performing a specified action upon detection of the dangerous condition;
  - fusible means for triggering the reaction means to perform the specified action upon fusing of the fusible means; and
  - firing means for fusing the fusible member upon detection of the dangerous condition.

**9. Evidence appendix.**

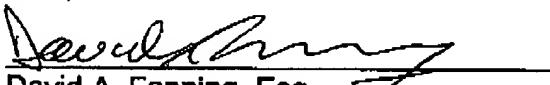
Evidence submitted during prosecution of the application pursuant to 37 C.F.R. 1.132 includes two declarations of Stephen F. Gass. Appellant relies on this evidence in this appeal. The original, signed copy of the first declaration was received by the Patent Office on July 7, 2004 and was entered it in the record on that date. The original, signed copy of the second declaration was received by the Patent Office on July 7, 2005 and was entered it in the record on that date. Copies of those declarations are attached.

**10. Related proceedings appendix.**

None.

Respectfully submitted,

SD3, LLC



David A. Fanning, Esq.  
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Customer No. 27630  
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Wilsonville, Oregon 97070  
Telephone: (503) 570-3200  
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**CERTIFICATE OF TRANSMISSION/MAILING**

I hereby certify that this Appeal Brief is being deposited with the U.S. Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, or facsimile transmitted to the U.S. Patent and Trademark Office to number (571) 273-8300, on the date shown below.

Date: February 21, 2006

  
\_\_\_\_\_  
David A. Fanning

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SAWSTOP LLC

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CENTRAL FAX CENTER PAGE 34/37**OFFICIAL**

JUL 07 2004

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of  
**STEPHEN F. GASS, ANDREW L. JOHNSTON,  
JOEL F. JENSEN, SUNG H. KIM,  
DAVID A. FANNING, and ROBERT L.  
CHAMBERLAIN**

Date: July 7, 2004

Serial No.: 09/929,240

Examiner Boyer D. Ashley

Filed: August 13, 2001

Group Art Unit 3724

For: FIRING SUBSYSTEM FOR USE IN A FAST-ACTING SAFETY SYSTEM

To: Commissioner for Patents  
Attention: Examiner Boyer D. Ashley  
Group Art Unit 3724  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

**DECLARATION OF STEPHEN F. GASS**

I, Stephen F. Gass, declare as follows:

1. I am a named inventor in the above-identified application.
2. I am a member of applicant SD3, LLC.
3. In an Office Action mailed April 7, 2004, the Examiner rejected claims in the above-identified application under 35 U.S.C. §103(a) in light of various I am filing this declaration to traverse those rejections and to submit evidence concerning non-obviousness.
4. My educational background is in physics. In 1986 I earned a Bachelor of Science degree in physics from Oregon State University, and graduated summa cum laude. In 1990 I was awarded a Ph.D. degree in physics from the University of California San Diego.

Page 1 - DECLARATION OF STEPHEN F. GASS  
Serial No. 09/929,240

PAGE 34/37 \* RCV'D AT 7/7/2004 7:12:11 PM [Eastern Daylight Time] \* SVR:USPTO-EFXRF-6/30 \* DNIS:2738300 \* CSID:5035703303 \* DURATION(mm:ss):04:22

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PAGE 35/37

5. The U.S. Consumer Product Safety Commission, National Electronic Injury Surveillance System, Directorate for Epidemiology, reports that every year in the United States there are over 90,000 people severely injured with power saws. These are all severe injuries that require a visit to a hospital emergency room. About 10% of these injuries result in amputations. The number and severity of these injuries shows there is a long felt need for safer saws. Others have tried to solve this problem, as evidenced by the Yurueda patent cited by the Examiner. However, the continued high number of severe injuries shows that those attempts have failed. Saws constructed as required by the claims currently pending in the above-identified application have the potential to significantly reduce the severity of these injuries.

6. The technology which is the basis for saws constructed as required by applicant's currently pending claims has been recognized with at least the following awards:

- Chairman's Commendation. The U.S. Consumer Product Safety Commission awarded the technology a Chairman's Commendation for significant contributions to product safety. That award was reported nationally on CNN Headline News.
- Challenger's Award. At an International Woodworking Fair in Atlanta, Georgia, the technology won the Challenger's Award, which is the woodworking industry's highest honor. It recognizes the most innovative and technically advanced improvements to woodworking equipment.
- Popular Science - One of the 100 Best New Innovations. The magazine Popular Science identified the technology as one of the 100 best new innovations of 2002.

Page 2. DECLARATION OF STEPHEN F. GASS  
Serial No. 09/020,240

PAGE 35/37 \* RCV'D AT 2/21/2006 4:51:22 PM [Eastern Standard Time] \* SVR:USPTO-EFXRF-6/30 \* DNIS:2738300 \* CSID:5035703303 \* DURATION (mm:ss):09:22

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PAGE 36/37

- Workbench Magazine – One of the Top 10 Tools for 2003. Workbench magazine included the saws incorporating the technology on its list of the top 10 innovative tools for 2003.
- Woodwork Institute of California Endorsement. The Woodwork Institute of California has endorsed the technology, stating:

As a Trade Association in the construction industry (representing over 250 manufacturers of architectural millwork with an excess of 4,000 employees, all of whom use saws of one type or another) we find your SawStop technology and its potential of eliminating or reducing worker injury of extreme significance. Generally, we would not endorse a commercial product; however the potential benefit to our members and their employees of implementing the SawStop technology on the tools used within our industry overrides such.

- Editor's Choice Award, Tools of the Trade. The magazine *Tools of the Trade* awarded the technology its 2001 Editor's Choice Award in recognition of its significance.

7. The technology that is the basis for the currently pending claims has also been the subject of extensive media coverage, including national coverage by CNN Headline News, by the television program NEXT@CNN, by the Associated Press, and by Paul Harvey on the ABC Radio Network. Numerous magazines have published reports about the technology saying it is "revolutionary," "unique" and "ingenious."

Page 3 - DECLARATION OF STEPHEN F. GASS  
Serial No. 09/929,240

PAGE 1871\*RCVD AT 7/7/2004 7:33:11 PM [Eastern Daylight Time]\*SVR:USPTO-EFXRF-01\*DNIS:3729381\*CSID:5036388601\*DURATION (mm:ss):03:22

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07/07/2004 16:26 5036388601

SAWSTOP LLC

PAGE 37/37

8. I hereby declare that all statements made herein of my own knowledge are true and all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

Date: July 7, 2004

  
Stephen F. Gass**CERTIFICATE OF TRANSMISSION/MAILING**

I hereby certify that this correspondence is being deposited with the U.S. Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, or facsimile transmitted to the U.S. Patent and Trademark Office to number (703) 872-9306, attention Examiner Boyer D. Ashley, on the date shown below.

Date: July 7, 2004  
Stephen F. GassPage 4- DECLARATION OF STEPHEN F. GASS  
Serial No. 09/829,240

PAGE 37/37 \* RCVD AT 07/07/2004 7:22:11 PM [Eastern Daylight Time] \* SVR:USPTO-EFXRF-6/30 \* DNIS:2738305 \* CSID:4036388601 \* DURATION (mm:ss):09:22

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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of  
**STEPHEN F. GASS, ANDREW L. JOHNSTON,  
JOEL F. JENSEN, SUNG H. KIM,  
DAVID A. FANNING, and ROBERT L.  
CHAMBERLAIN**

Date: July 7, 2005

Serial No.: 09/929,240

Examiner Boyer D. Ashley

Filed: August 13, 2001

Group Art Unit 3724

For: **FIRING SUBSYSTEM FOR USE IN A FAST-ACTING SAFETY SYSTEM**

To: Commissioner for Patents  
Attention: Examiner Boyer D. Ashley  
Group Art Unit 3724  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

**SECOND DECLARATION OF STEPHEN F. GASS**

I, Stephen F. Gass, declare as follows:

1. I am a named inventor in the above-identified application.
2. I am a member of applicant SD3, LLC.
3. In an Office Action mailed March 7, 2005, the Examiner rejected claims in the above-identified application under 35 U.S.C. 103(a) in light of various references. I am filing this declaration to traverse those rejections and to submit objective evidence of non-obviousness. I have previously submitted another declaration to submit evidence concerning non-obviousness.
4. My educational background is in physics. In 1986 I earned a Bachelor of Science degree in physics from Oregon State University, and graduated summa cum laude. In 1990 I was awarded a Ph.D. degree in physics from the University of California San Diego.

Page 1- **SECOND DECLARATION OF STEPHEN F. GASS**  
Serial No. 09/929,240

PAGE 40/60 \* RCV'D AT 7/7/2005 7:22:24 PM [Eastern Daylight Time] \* SVR:USPTO-EFXRF-10 \* DNIS:272900 \* CSID:5036388601 \* DURATION (mm:ss):51:48

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5. Attached is a true and correct copy of a notice filed with the Department of Justice, Antitrust Division, pursuant to the National Cooperative Research and Production Act of 1993, by The Black & Decker Corp., Hitachi Koki, U.S.A., Ltd., Pentair Tools Group, Robert Bosch Tool Corporation, and Ryobi Technologies, Inc. The notice was published December 1, 2003, and it says those companies have entered into a joint venture to research and develop "technology for power saw blade contact injury avoidance, including skin sensing systems, blade braking systems, and/or blade guarding systems." This notice shows that others have been working to develop safer saws.

6. Attached is a true and correct copy of a report from the U.S. Consumer Product Safety Commission dated June 2003 showing that the total cost to society from injuries involving bench and table saws is about \$2 billion annually. This report shows there has been a long-felt but unsatisfied need for safer saws.

7. The technology which is the basis for saws constructed as required by applicant's currently pending claims has been recognized with the following additional award: 2005 Reader's Choice Award from Woodshop News magazine, which is an award given to a new tool or machine that has significantly increased productivity or quality of work. This award supports the conclusion that applicant's claimed invention is non-obvious and it shows public interest in and demand for saws constructed as required by applicant's claims.

8. The technology that is the basis for the currently pending claims continues to be the subject of extensive media coverage, including the following:

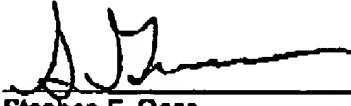
- Tools and Techniques – television show, DIY network, scheduled to air in August 2005
- *Inc. Magazine* – July 2005
- *Consumer Electronics CE Lifestyles magazine* – July 2005
- *Fortune Small Business magazine* – June 2005
- *Electronic Design magazine* – June 2005
- *CAM Magazine* (published by the Construction Association of Michigan) – June 2005
- *Woodshop News magazine* – June 2005
- American Home 2005 - television show, HGTV, January 2005
- *Fine Woodworking magazine* – Winter 2004/2005
- *Fine Woodworking magazine* – August 2004

This media coverage supports the conclusion that the currently pending claims are non-obvious.

9. Saws constructed as claimed in the present application have saved the hands of at least 10 people from serious injury when their hands accidentally contacted the spinning blade of the saw. These people include one high school sophomore, one university student and one blind woodworker. Ron Huisenga, one of the people whose hand was saved, posted pictures of his accident on the Internet. Those pictures may be viewed by going to [www.huisenga.org](http://www.huisenga.org) and clicking on the words "Click Here." After entering the site, click on the words "Photo Gallery" and then click on the words "The Accident" about half way down on the right side. The fact that the technology claimed in the present application has saved 10 people from what otherwise could have been life-changing injuries is further evidence that the claims are not obvious.

10. I hereby declare that all statements made herein of my own knowledge are true and all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

Date: July 7, 2005

  
Stephen F. Gass

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PAGE 53/71

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Date: July 7, 2005

  
Stephen F. Gass

Page 5- SECOND DECLARATION OF STEPHEN F. GAASS  
Serial No. 09/929,240

PAGE 44/60 \*RCVD AT 7/7/2005 7:22:24 PM [Eastern Daylight Time]\* SVR:USPTO-EFXRF-10 \* DNIS:3729306 \* CSID:5036388501 \* DURATION (mm:ss):51-08

PAGE 53/71 \*RCVD AT 2/21/2006 4:51:22 PM [Eastern Standard Time]\* SVR:USPTO-EFXRF-6/30 \* DNIS:2738300 \* CSID:5035703303 \* DURATION (mm:ss):29-24

**67216****Federal Register / Vol. 68, No. 230 / Monday, December 1, 2003 / Notices**

Act on September 13, 2000 (65 FR 55283).

The last notification was filed with the Department on August 8, 2003. A notice was published in the Federal Register pursuant to section 6(b) of the Act on August 29, 2003 (68 FR 52055).

**Dorothy B. Fountain,**  
*Deputy Director of Operations, Antitrust Division.*  
[FR Doc. 03-29833 Filed 11-28-03; 8:45 am]  
BILLING CODE 4410-11-M

**DEPARTMENT OF JUSTICE****Antitrust Division****Notice Pursuant to the National Cooperative Research and Production Act of 1993—Nano-Engineered Thermal Interfaces Enabling Next Generation Microelectronics**

Notice is hereby given that, on October 2, 2003, pursuant to Section 6(a) of the National Cooperative Research and Production Act of 1993, 15 U.S.C. 4301 *et seq.* ("the Act"), Nano-Engineered Thermal Interfaces Enabling Next Generation Microelectronics has filed written notifications simultaneously with the Attorney General and the Federal Trade Commission disclosing (1) the identities of the parties and (2) the nature and objectives of the venture. The notifications were filed for the purpose of invoking the Act's provisions limiting the recovery of antitrust plaintiffs to actual damages under specified circumstances. Pursuant to Section 6(b) of the Act, the identities of the parties are General Electric Global Research, Niskayuna, NY; Superior MicroPowders, LLC, Albuquerque, New Mexico; and The Research Foundation of SUNY at Binghamton, Binghamton, NY. The nature and objectives of the venture are to develop and demonstrate nano-engineered thermal interfaces materials enabling next generation microelectronics.

**Dorothy B. Fountain,**  
*Deputy Director of Operations, Antitrust Division.*  
[FR Doc. 03-29762 Filed 11-28-03; 8:45 am]  
BILLING CODE 4410-14-M

**DEPARTMENT OF JUSTICE****Antitrust Division****Notice Pursuant to the National Cooperative Research and Production Act of 1993 Power Tool Institute Joint Venture Project**

Notice is hereby given that, on October 23, 2003, pursuant to section 6(a) of the National Cooperative Research and Production Act of 1993, 15 U.S.C. 4301 *et seq.* ("the Act"), the Power Tool Institute Joint Venture Project has filed written notifications simultaneously with the Attorney General and the Federal Trade Commission disclosing (1) the identities of the parties and (2) the nature and objectives of the venture. The notifications were filed for the purpose of invoking the Act's provisions limiting the recovery of antitrust plaintiffs to actual damages under specified circumstances. Pursuant to section 6(b) of the Act, the identities of the parties are The Black & Decker Corp., Towson, MD; Hitachi Koki, U.S.A., Ltd., Norcross, GA, a subsidiary of Hitachi Koki Company Ltd., Tokyo, Japan; Pentair Tools Group, Jackson, TN, a subsidiary of Pentair Corporation, Golden Valley, MN; Robert Bosch Tool Corporation, Mount Prospect, IL, an affiliated entity of Robert Bosch GMBH, Gerlingen, Germany and Scintilla AG, Solothurn, Switzerland; and Ryobi Technologies, Inc., Anderson, SC and One World Technologies, Inc., Anderson, SC, both subsidiaries of Techtronics Inc., Tsuen Wan, Hong Kong, China. The nature and objectives of the venture are the research and development of technology for power saw blade contact injury avoidance, including skin sensing systems, blade braking systems, and/or blade guarding systems. The participants intend to share confidential information and intellectual property rights in order to achieve the goals of the joint venture. The participants intend to share intellectual property that is contributed, and any intellectual property or technology that is developed through the joint venture, among themselves and the Power Tool Institute. Any royalties generated by the licensing of any technology or intellectual property created through the joint venture will be shared among the joint venture participants and the Power Tool Institute pursuant to the terms of the joint venture agreement and the accompanying confidentiality agreements. The technology or intellectual property created through the joint venture will be available to the

public for a licensing fee, which will be non-discriminatory and determined in accordance with the costs to develop the intellectual property to be licensed.

**Dorothy B. Fountain,**  
*Deputy Director of Operations, Antitrust Division.*

[FR Doc. 03-29834 Filed 11-28-03; 8:45 am]  
BILLING CODE 4410-11-M

**DEPARTMENT OF JUSTICE****Antitrust Division****Notice Pursuant to the National Cooperative Research and Production Act of 1993—Roll to Roll Processing To Enable the Organic Electronic Revolution**

Notice is hereby given that, on October 16, 2003, pursuant to section 6(a) of the National Cooperative Research and Production Act of 1993, 15 U.S.C. 4301 *et seq.* ("the Act"), Roll to Roll Processing to Enable the Organic Electronic Revolution has filed written notifications simultaneously with the Attorney General and the Federal Trade Commission disclosing (1) the identities of the parties and (2) the nature and objectives of the venture. The notifications were filed for the purpose of invoking the Act's provisions limiting the recovery of antitrust plaintiffs to actual damages under specified circumstances. Pursuant to section 6(b) of the Act, the identities of the parties are GE Global Research, Niskayuna, NY; and Energy Conversion Devices, Inc., Rochester Hills, MI. The nature and objectives of the venture are to develop and demonstrate roll to roll processing to enable the organic electronics industry by providing highly functional devices at low cost and high volume.

**Dorothy B. Fountain,**  
*Deputy Director of Operations, Antitrust Division.*

[FR Doc. 03-29832 Filed 11-28-03; 8:45 am]  
BILLING CODE 4410-11-M

**DEPARTMENT OF LABOR****Mine Safety and Health Administration****Evaluation of International Electrotechnical Commission's (IEC) Standards for Intrinsic Safety and Explosion-Proof Enclosures**

**AGENCY:** Mine Safety and Health Administration (MSHA), Labor.

**ACTION:** Notice of intent to review international (IEC) standards for



## Hazard Screening Report

**Power Tools and Workshop Equipment**

(Product codes 800-819, 821-893)

June 2003

Natalie Marcy  
George Rutherford  
Alberta Mills

## Introduction

The group of products included in this report consists of Power Tools and Workshop Equipment. This report provides several pieces of information that will allow the reader to compare products within this report as well as to compare with products in other categories in reports that will follow.

This report shows an index of the size of the overall injury and death problem associated with Power Tools and Workshop Equipment. The first information presented is a summary of the injury, death and cost data for the entire class of products. A trend graphic (figure1) is presented which shows the frequency of emergency room-treated injuries since 1997. This is followed by a pie chart (figure 2) showing the distribution of the injuries for this class of products by energy source of the hazard, i.e., mechanical, fire, electrical, chemical, or other. There is also a summary table, which shows the injuries, deaths and costs associated with each product group.

Finally, this report presents information on two hazards common to several of the products examined.

## Power Tools and Workshop Equipment

### Individual Product Categories

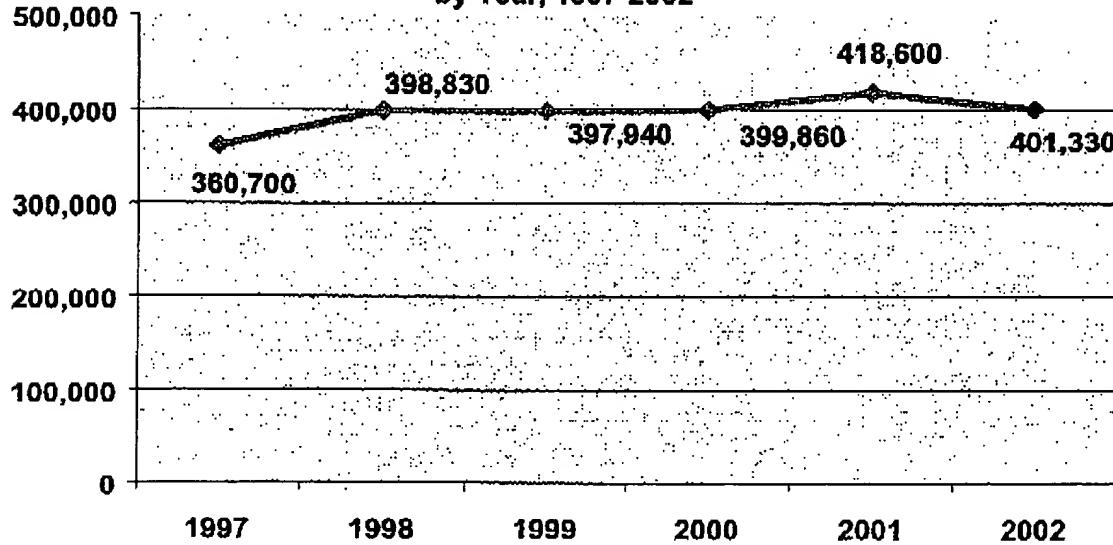
- Powered drills
- Welding, soldering, cutting torches
- Manual workshop tools
- Grinders, buffers, polishers
- Batteries, battery chargers
- Painting equipment, sprayers
- Miscellaneous workshop tools
- Power sanders
- Other portable or stationary power tools
- Hoists, lifts, jacks, or jack stands
- Automotive tools or accessories
- Air compressors (separate)
- Drills, not specified
- Nail guns or stud drivers
- Stretch cords or straps
- Miscellaneous power tools
- Saws, not specified
- Hand saws
- Portable circular power saws
- Bench or table saws
- Band saws
- Other power saws
- Power saws, not specified
- Jigsaws

**Power Tools and Workshop Equipment  
(800-819, 821-893)**

ER-Treated Injuries 2001 <sup>1</sup>	418,610	Percent of Households	n/a
Medically-Treated Injuries 2001	960,880	Number of Products in Use	N/A
Percent of ER-Treated Hospitalized Deaths 2000	3.3%	Estimated Useful Life	N/A
Number of Incident Reports 2002	580	Estimated Retail Price Range	N/A
Cost of Medically-Treated Injuries (Millions)	\$15,421.3	Death Costs (Millions)	\$915
		Total Known Costs (Millions) <sup>2</sup>	\$16,336.3

NOTE: N/A indicates information is not available. If information is not applicable, table will say n/a.

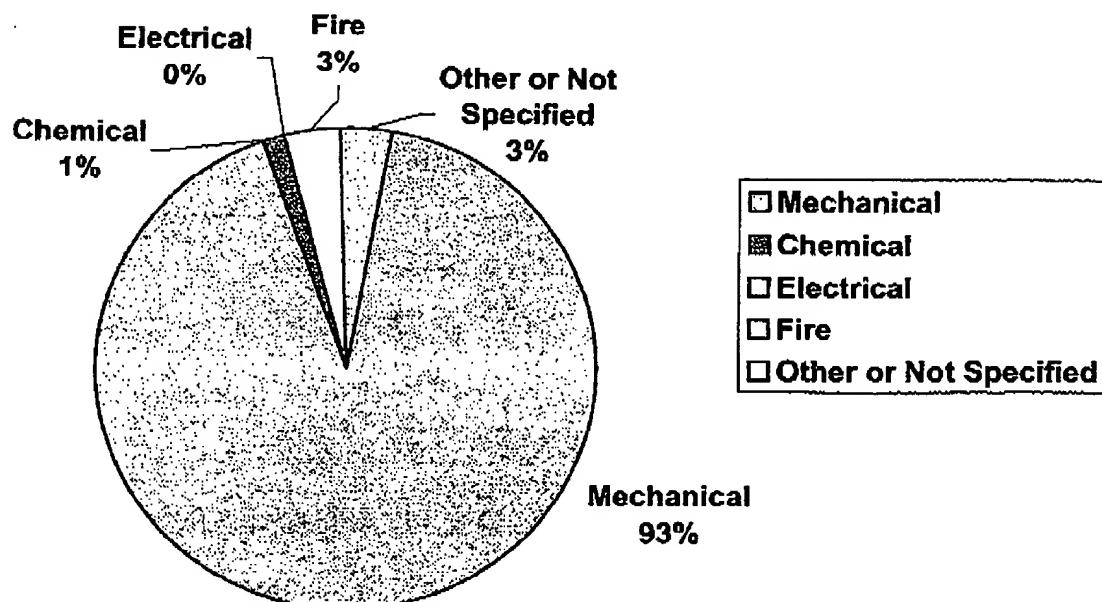
**Figure 1. Estimated Number of Emergency Room-Treated Injuries Associated with Power Tools and Workshop Equipment, by Year, 1997-2002**



<sup>1</sup> Emergency room-treated injury estimates (NEISS) for 2001 are presented, because the 2002 NEISS data were not officially complete at the time this report was prepared. As a result, this was the most recent year for which the Injury Cost Model could produce estimates from NEISS of medically-treated injuries and of injury costs. The trend graph shown in Figure 1 includes the preliminary NEISS estimate from 2002 to provide the most complete, current picture of the trend in injuries.

<sup>2</sup> This total represents an index rather than an actual single year estimate of costs, because injury costs are based on 2001 and death costs are based on 2000. These are the most recent years for which each of these cost items was available.

**Figure 2. Distribution of Emergency Room-Treated Injuries by Energy Source of the Hazard for Power Tools and Workshop Equipment, 1997-2002**



### Deaths

For 2000, CPSC has reports of 183 deaths associated with these products. Eighty-one of these deaths were associated with Miscellaneous workshop tools, 39 were associated with Hoists, lifts, jacks, or jack stands, and 22 were associated with Welding, soldering or cutting torches. The remaining 41 deaths were associated with the remaining product categories.

## Overview Summary

The change in injury frequency over the 6-year period, 1997 – 2002, was a marginally statistically significant (.05 < p=.092 < .10) increase of just over 40,000 emergency room-treated injuries.

Table 1 provides a summary of all the product groups examined for this report. This table provides information on the number of emergency room-treated injuries, the number of medically-treated injuries, the percentage of the emergency room treatments that resulted in admission to the hospital, the number of incident reports received, the number of deaths reported, the number of products of each type in use, the estimated useful product life for each category, the costs associated with deaths and medically-treated injuries and the total of these two cost estimates.

### Addressability

While it is useful to know the number of injuries, deaths, and related costs associated with a product, it is also important to have an estimate of how much of that social cost might actually be addressed through some action. Many of the injuries treated in emergency rooms that were related to Power Tools and Workshop Equipment may not be addressable. To know the actual addressability of the hazards associated with a product usually requires detailed study of the problem, and the product. This level of study is not feasible for this type of overview report. What we have done is to identify that portion of the injury and death costs that is not addressable. These proportions were then applied to the cost estimates for each product group, to produce an estimate of *maximum* addressable costs.

**The maximum addressable cost estimate does not necessarily represent the injury and death costs that the CPSC might actually be able to prevent each year through some type of action. It represents only a target population from which any successful prevention will have to come.**

The reason for doing this kind of review is to identify situations such as the following example and allow us to focus on the areas where CPSC action could have some effect.

Example: The category Manual Workshop Tools is the top ranked category with regard to total injury costs. Almost 30% of the injuries involved a hammer. For the most part, consumers struck their hands or thumbs with the hammer during use. An additional 39% of the injuries involved knives with retractable blades and 94% of those injuries were lacerations. With both of these products, the most common injuries are inherent to the nature of the product. There is very little CPSC can do to reduce these injuries so they are considered to be incidental injuries.

The staff reviewed the narratives included in National Electronic Injury Surveillance System (NEISS) injury reports, and reviewed the individual death reports.<sup>3</sup> Because the

<sup>3</sup> See Methodology Section for a description of these databases.

NEISS narratives are very short and often do not provide much detail, cases were categorized as "not addressable" only if it was clear that the injury was incidental or not related to anything about the product. If, for example, all we knew about a case involving a power saw was that it resulted from blade contact, this was not enough information to conclude that the case was "not addressable." Such cases would be left in the "maximum addressable" category. The death reports often, but not always, had more information, allowing for better determination of addressability.

By applying this percentage to the total cost of medically-treated injuries, staff estimated the *maximum addressable* cost associated with injuries for each product or product group. Deaths were also reviewed and determined to be in either the not-addressable or maximum addressable category, and were valued at \$5 million dollars each. Table 2 shows the percentage of injuries included in the maximum addressable category for each product group. It also shows how many of the deaths reported were included in the maximum addressable category.

The staff is currently considering whether there may be a difference between costs associated with addressable injuries and costs associated with non-addressable injuries. It may be that incidental injuries with little product involvement tend to be less severe and therefore associated with lower average costs per injury. If incidental injuries do tend to be less costly, our methodology, which applies a percentage to the total injury costs, would tend to underestimate the maximum addressable costs associated with product groups. The staff is currently developing a methodology to address this issue.

Overall, after applying this process of review of the data to the entire category of Power Tools and Workshop Equipment, we find that the total maximum addressable injury and death cost is \$5.7 billion dollars, out of a total cost associated with these products of \$16.3 billion dollars, about 35% maximum addressable.

Figure 3 shows the index<sup>4</sup> of estimated injury and death costs for each of the product categories and the estimated maximum addressability of those costs.

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<sup>4</sup> This total represents an index rather than an actual single year estimate of costs, because injury costs are based on 2001 and the death costs are based on 2000. These are the most recent years for which each of these cost items was available.

Table 1 - Product Summary Table - Injury, Death, and Cost Estimates

Product	Codes	ER Injuries 2001	All Medically-Treated Injuries 2001	% Hospitalized 2001	Incident reports 2002	Deaths 2000	% of Households (millions)	# of Products in Use (millions)	Estimated Useful Product Life (Years)	Death Costs* 2000 (billions)	Med. Ind. Injury Costs* 2001 (billions)	Total Known Costs (millions)
over drills	855, 856, 871	5,789	12,981	4.0%	48	6	91%	95,1	11	\$30	\$188	\$218
Velving, drilling, cutting roches	812, 831, 867, 859, 866, 868, 874	18,726	37,189	1.7%	68	22	N/A	N/A	N/A	\$110	\$781	\$891
Janual workshop jobs	827, 828, 829, 834, 836, 857, 862, 870, 878, 879, 881	147,729	333,884	1.4%	23	1	n/a	n/a	n/a	\$5	\$1,808	\$3,813
rinder, buffer, olisher	865, 873, 876	17,025	45,471	0.8%	13	5	18%	19	9	\$25	\$333	\$338
alenes, battery baggers	883, 884	9,908	23,852	4.7%	185	4	n/a	n/a	n/a	\$20	\$464	\$484
austing tuitment,	887, 888	3,936	11,115	1.8%	26	2	0.5%	.5	10	\$10	\$157	\$167
fisellateous workshop	815, 833, 835, 837, 852, 854, 869, 877, 880, 885, 893	60,739	149,999	3.5%	61	81	n/a	n/a	n/a	\$405	\$2,844	\$3,249
over sanders	803	1,032	2,393	1.6%	6	0	36%	37,4	9	\$0	\$34	\$34
ther portable or aitionary power xbs	809	2,781	7,067	7.9%	19	2	n/a	n/a	n/a	\$10	\$160	\$170
toits, nts, jacks rjack stands	814	16,145	43,179	3.4%	35	39	N/A	N/A	N/A	\$195	\$988	\$1,183
Automotive tools	821	661	1,744	-	13	1	N/A	N/A	N/A	\$35	\$57	\$52
Accessories	823	2,380	6,529	0.8%	12	2	N/A	N/A	10	\$10	\$104	\$114
compressors (separate)	847	14,252	33,168	-	4	0	n/a	n/a	n/a	\$0	\$336	\$336
wils, not specified	882	14,626	32,055	5.9%	6	0	N/A	N/A	N/A	\$0	\$338	\$338
ail guns or stud nives	886	4,851	11,415	0.4%	6	2	N/A	N/A	N/A	\$10	\$108	\$118
retch cords or xps	804, 805, 807, 808	4,122	8,978	3.1%	5	2	1.9%	15,3	11	\$10	\$239	\$249

n/a - Not available

\* Descriptions of how these estimates were derived can be found in the Methodology Section.

**Table 1 – Product Summary Table – Injury, Death, and Cost Estimates (Continued)**

Product Codes	ER Injuries	All Medically-Treated Injuries	% hospitalized	Incident reports 2002	Deaths 2000	% of Households	# of Products in Use (millions)	Estimated Useful Product Life (years)	Death Costs* 2000 (millions)	Med. Ttd. Injury Costs* 2001 (millions)	Total Known Costs (millions)
aws, NS 845	24,555	55,652	2.5%	3	5	n/a	n/a	n/a	\$25	\$941	\$566
Hand saws 830	5215	10,923	-	1	1	N/A	N/A	N/A	\$5	\$109	\$114
Portable circular saws 832	10,584	22,430	10.5%	10	2	48%	50	12	\$10	\$618	\$628
Bench or table saws aws	31,884	64,651	9.9%	7	0	N/A	N/A	15	\$0	\$1,967	\$1,967
Hand saws 842	3,601	7,368	0.9%	0	0	N/A	N/A	15	\$0	\$148	\$148
Other power saws 864	841, 844, 853, 6,987	14,930	5.1%	25	3	n/a	n/a	n/a	\$15	\$361	\$376
Over saws, NS 872	9,988	21,548	3.7%	4	3	n/a	n/a	n/a	\$15	\$329	\$344
Hand saws 875	1,060	2,400	-	0	0	55%	57.8	12	\$0	\$21	\$21

N/A - Not available n/a - Not applicable, there is no actual product to estimate number in use or product life.

NS - not specified.

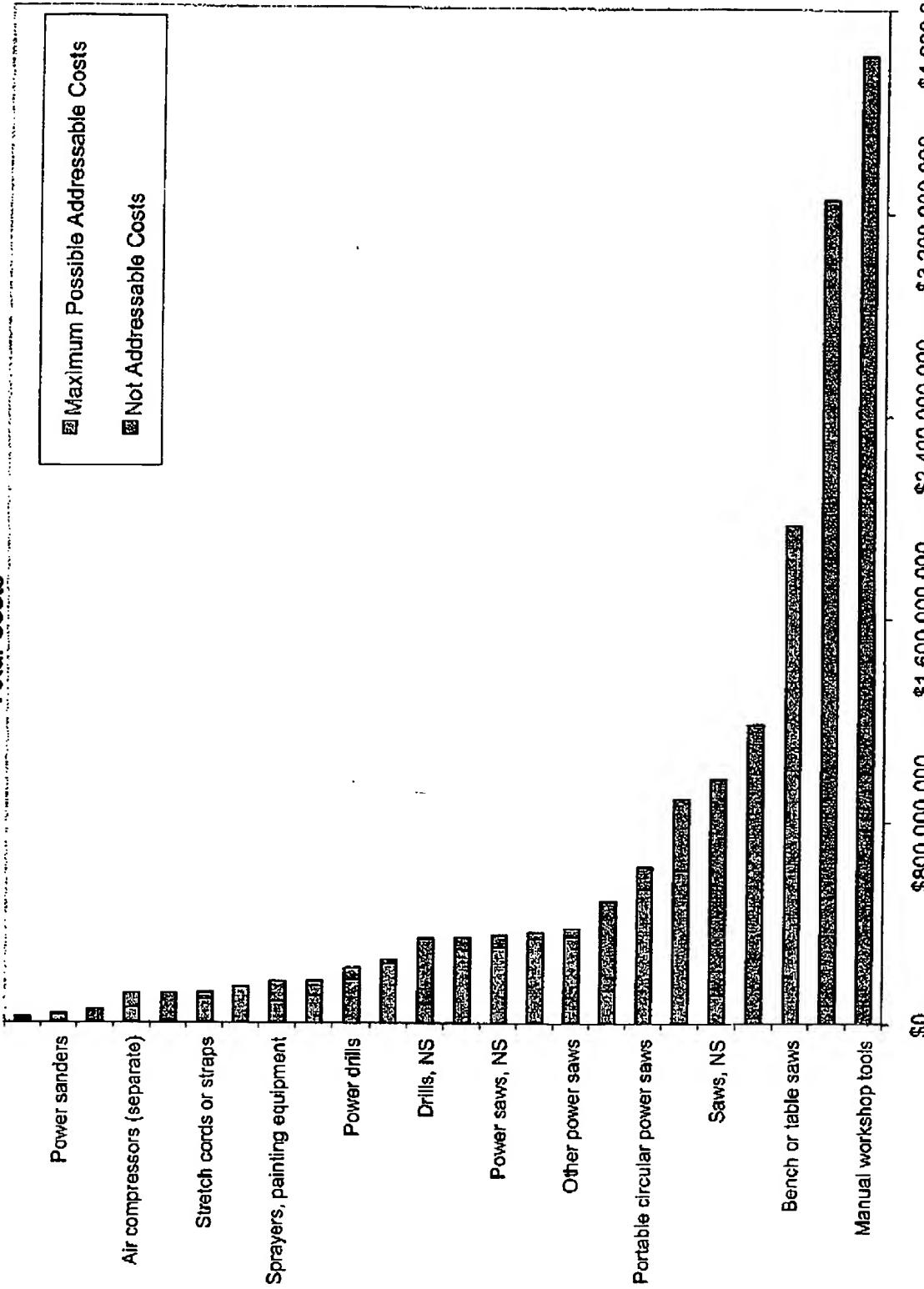
Table 3 lists all of the product groups ranked in descending order by the Total Injury and Death Costs Index. This table also shows the total maximum addressable cost for each product group and, for those product groups where there was an estimate of number of products in use, the maximum addressable cost per unit of the product in use. Rankings of the product groups on total costs, maximum addressable costs, and maximum addressable cost per unit are also provided.

Three of the top four product groups in terms of overall cost, Manual workshop tools, Miscellaneous workshop tools, and Hoists, lifts, jacks, and jack stands, accounted for half of the total costs (\$8 billion) for the whole category Power Tools and Workshop Equipment, but only \$101 million in maximum addressable costs. These and several other products or product groups were identified as associated with mostly incidental injuries. While there may still be some hazards involving these products that are worth addressing, these hazards do not represent a large share of the social costs associated with the products.

Products and hazards identified for which further study or hazard reduction activity may be appropriate are noted below:

- Powered drills may need further evaluation. This product was associated with a high percentage of maximum addressable injuries (79% of injuries and 5 of 6 deaths). Also, there are several drill rechargeable battery-related reported incidents that are included under the Batteries, battery chargers discussion on page 13.
- Welding, soldering, and cutting torch-related injuries are most often to the eyes, most likely due to the users not wearing the appropriate eye protection. This hazard may be difficult to address. The 14 deaths that were included in maximum addressable involved electrocution, clothing ignition, other fires, and carbon monoxide poisoning.
- Grinder, buffer, or polisher-related injuries are most often due to foreign bodies in the eyes. In most cases, it is unknown if the consumer was wearing safety glasses. This may merit further study.
- Battery, battery charger hazards may merit further study because of improved rechargeable battery technology and the wider use of rechargeable batteries. There were many reported incidents that involved rechargeable battery hazards.
- Power washer-related injuries are on the rise possibly because of the increased popularity of the product. The product group, Painting equipment and sprayers, which includes power washers should be monitored to determine if additional study is needed.
- The Nail guns or stud drivers category includes pneumatic nail guns, which have been addressed by a new voluntary standard which became effective on May 1, 2003. This product group should be monitored for standard effectiveness.
- Stretch cords or straps have a low hospitalization percentage but are of concern since most of the injuries are to the head region. This category may need to be studied to determine what portion of the 86% of the injuries included in maximum addressable might, in fact, be preventable.
- Injuries involving blade contact (which were included among maximum addressable) account for approximately 83% of power saw-related injuries and a major part of the societal costs. Half of these injuries involved bench or table saws and a large portion involved portable circular power saws. More detailed study of this category of products is needed.

**Figure 3. Estimated Cost Index in Millions of Dollars, Power Tools and Workshop Equipment, by Total Costs**



\* This estimate of maximum addressability does not necessarily represent the costs that the CPSC might actually be able to prevent each year through some type of action. It represents only a target population from which any successful prevention will have to come.

\* The data presented in this graphic are also contained in Table 3 under the headings "Total injury and death costs" and "Total maximum addressable costs".

**Table 2 – Product Hazard Addressability**

Product	Codes	Percentage of injuries included in Maximum Addressable	Maximum Number of Addressable Deaths/ Total Deaths Reported
Power drills	855, 856, 871	79%	5 of 6
Welding, soldering, cutting torches	812, 831, 859, 866, 867, 868, 874	68%	14 of 22
Manual workshop tools	827, 828, 829, 834, 836, 857, 862, 870, 878, 879, 881	0	0 of 1
Grinder, buffer, polisher	865, 873, 876	94%	4 of 5
Battery, battery chargers	883, 884	26%	2 of 4
Painting equipment, sprayers	887, 888	55%	0 of 2
Miscellaneous workshop	815, 833, 835, 837, 852, 854, 869, 877, 880, 885, 893	2%	4 of 81
Power sanders	803	91%	0
Other portable or stationary power tools	809	58%	0 of 2
Hoists, lifts, jacks or jack stands	814	2%	1 of 39
Automotive tools or accessories	821	0	0 of 1
Air compressors (separate)	823	46%	2 of 2
Drills, not specified	847	23%	0
Nail guns or stud drivers	882	87%	0
Stretch cords or straps	886	86%	0 of 2
Misc. power tools	804, 805, 807, 808	96%	1 of 2
Saws, NS	845	10%	3 of 5
Hand saws	830	3%	1 of 1
Portable circular power saws	832	85%	2 of 2
Bench or table saws	841	96%	0
Band saws	842	97%	0
Other power saws	843, 844, 863, 864	91%	3 of 3
Power saws, NS	872	87%	3 of 3
Jigsaws	875	76%	0
Total	-	30.8%	45 of 183

Table 3 - Calculation of Indices<sup>5</sup> using cost estimates from Injury Cost Model, Death Certificates File, and Estimates of Number of Products in use.

Title	Medically Attended Injury Costs	Total Death Costs	Number of Products in Use	Rank on Total Addressable Costs	Rank on Maximum Addressable Costs	Products in Use (Millions)	Maximum Addressable Costs per Unit	Rank on Maximum Addressable Costs per Unit
Mental workshop tools	\$3,807,571,480	\$5,000,000	1,000	1	23	2.9	n/a	n/a
Miscellaneous workshop	\$2,844,243,991	\$405,000,000	1,000	2	17	n/a	n/a	n/a
Bench or table saws	\$1,966,863,116	\$0	1,000	3	1	1		
Hoists, lifts, jacks or jack stands	\$988,383,745	\$195,000,000	1,000	4	20			
Saws, NS	\$941,159,833	\$25,000,000	1,000	5	12	n/a	n/a	n/a
Welding, soldering, cutting	\$780,934,297	\$110,000,000	1,000	6	2			
Portable circular power saws	\$617,717,382	\$10,000,000	1,000	7	3	50	\$10,75	2
Battery, battery charger	\$463,958,120	\$20,000,000	1,000	8	11	n/a	n/a	n/a
Other power saws	\$300,603,063	\$15,000,000	1,000	9	4	n/a	n/a	n/a
Grinder, buffer, polisher	\$332,709,271	\$25,000,000	1,000	10	5	19	\$17,51	13
Power saws, NS	\$329,136,591	\$15,000,000	1,000	11	6	6	n/a	n/a
Nail guns or stud drivers	\$338,689	\$0	1,000	12	7			
Drills, NS	\$335,609,644	\$0	1,000	13	16	n/a	n/a	n/a
Misc. power tools	\$229,071,992	\$10,000,000	1,000	14	8			
Power drills	\$187,938,582	\$10,000,000	1,000	15	9	95.1	\$1,82	3
Other portable or stationary power tools	\$159,889,993	\$10,000,000	1,000	16	14	n/a	n/a	n/a
Painting equipment, sprayers	\$146,544,452	\$10,000,000	1,000	17	15			
Band saws	\$148,275,070	\$0	1,000	18	10			
Stretch cords or straps	\$187,732,999	\$10,000,000	1,000	19	13			
Hand saws	\$109,109,914	\$5,000,000	1,000	20	22			
Air compressors (separate)	\$103,771,146	\$10,000,000	1,000	21	13			
Automotive tools or accessories	\$46,955,850	\$5,000,000	1,000	22	24			
Power sanders	\$14,410,506	\$0	1,000	23	19	37.4	\$0,84	4
Jigsaw	\$20,696,721	\$0	1,000	24	21	57.8	\$0,27	5
Total	\$15,421,293,449	\$915,000,000	1,000					

<sup>5</sup> These estimates are indices, not actual estimates of expected injury cost reduction. This is because injury cost estimates are based on 2001 emergency room-treated injury estimates, death cost estimates are based on deaths reported which occurred in 2000, and addressability estimates of injuries are based on review of NEISS comments for 2001. Estimates of number of products in use are also very imprecise estimates. The cost figures in the table do not represent an actual estimate of the costs associated with any of the product groups for a specific year. They were developed, using the data available, to provide indices for the purpose of comparison.

## Generic Product Hazards

### Batteries/Battery Chargers

Forty-three reported incidents involved a power tool battery or battery charger. The most common hazard involved the charger overheating and resulting in the charger/battery melting or starting a fire. Battery or battery charger hazards are the most common powered drill hazards (32 out of 48). There was one reported death from a fire, which was started by a battery charger on a workbench.

Historically, battery power has been most popular and feasible with drills and screwdrivers because they require less power output and are not used for long, continuous periods of time. These two are expected to continue to be the two largest categories of battery-powered tools. Other battery-powered tools include reciprocating saws, sanding and grinding tools, rotary hammers, impact drivers, impact wrenches, staplers, and nailers. Battery technology is improving to provide better power output, expanding the possibilities for battery-powered tools. Cordless power saws are expected to become more prevalent and popular.

In one source of market information<sup>6</sup>, the improving level of battery technology is said to be creating more powerful and longer running saws. Cordless power tools are becoming more popular because of their ease of use and mobility. Sales of cordless electric tools are forecast to increase at a higher rate annually compared with corded (plug-in) electric tools. The newer technology batteries, with the possibility of increased fire potential, are opening the door to a wider range of battery operated products and thus increasing the use of the newer type of batteries. Because of this, we might expect to see an increase in the number of fire-related battery or battery charger incidents.

### Power saws

This is more a class of product hazards than a generic hazard. A large number of injuries are associated with power saws<sup>7</sup>, 64,100 in 2001. Roughly 83% of the power saw-related injuries involved blade contact and are included in the maximum addressable injuries. Half of the power saw injuries involved bench or table saws. However, the generic concern is related to portable power saws. One source of market share information<sup>7</sup>, stated that sales of cordless power tools are forecast to increase at a higher rate than plug-in power tools. The source also states that with improved battery technology, cordless power saws will become more prevalent and popular. If there is such a shift towards cordless power saws, this could have an effect on either the frequency or the pattern of injuries associated with these products. However, we do not currently have any indication of what this effect might be or when it might be seen.

<sup>6</sup> The Freedonia Group. "Power and Hand Tools to 2005: Market Size, Market Share, and Demand Forecast." Study #1478, October 2001. <<http://www.freedoniagroup.com>> pages 52, 57-58, 64.

<sup>7</sup> Includes the product codes for: portable circular power saws, bench or table saws, band saws, jigsaws, other power saws (this group includes product codes for other power saws, radial arm saws, power hack saws, and saber saws), and power saws, not specified.

## Methodology

### NEISS

The Commission operates the National Electronic Injury Surveillance System, a probability sample of 98 U.S. hospitals with 24-hour emergency rooms (ERs) and more than six beds. These hospitals provide CPSC with data on all consumer product-related injury victims seeking treatment in the hospitals' ERs. Injury and victim characteristics, along with a short description of the incident, are coded at the hospital and sent electronically to CPSC.

Because NEISS is a probability sample, each case collected represents a number of cases (the case's *weight*) of the total estimate of injuries in the U.S. The weight that a case from a particular hospital carries is associated with the number of hospitals in the U.S. of a similar size. NEISS hospitals are stratified by size based on the number of annual emergency-room visits. NEISS comprises small, medium, large and very large hospitals, and includes a special stratum for children's hospitals.<sup>8</sup>

This analysis uses NEISS data for the period 1/1/1997 through 12/31/2002. Data collection for 2002 was not closed when this report was prepared.

### CPSC's Death Certificate Database

CPSC purchases death certificates from all 50 states, New York City, the District of Columbia and some territories. Only those certificates in certain E-codes (based on the World Health Organization's International Classification of Diseases ICD-10 system) are purchased. These are then examined for product involvement before being entered into CPSC's death certificate database. The result is neither a statistical sample nor a complete count of product-related deaths, nor does it constitute a national estimate. The database provides only counts of product-related deaths from a subset of E-codes. For this reason, these counts tend to be underestimates of the actual numbers of product-related deaths.

Death certificate collection from the states takes time. Data for 2001 and 2002 are not complete.

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<sup>8</sup> Kessler, Eileen and Schroeder, Tom. The NEISS Sample (Design and Implementation). U.S. Consumer Product Safety Commission. October 1999.

### CPSC's Injury or Potential Injury Incident File (IPII)

IPII is a CPSC database containing reports of injuries or potential injuries made to the Commission. These reports come from news clips, consumer complaints received by mail or through CPSC's telephone hotline or web site, Medical Examiners and Coroners Alert Program (MECAP) reports, letters from lawyers, and similar sources. While the IPII database does not constitute a statistical sample, it can provide CPSC staff with guidance or direction in investigating potential hazards.

### CPSC's Injury Cost Model

The Injury Cost Model (ICM) is a computerized analytical tool designed to measure the direct and indirect costs associated with consumer product-related injuries. In addition to providing a descriptive measure of injury hazards in monetary terms, the ICM is also used to estimate the benefits of regulatory actions designed to reduce consumer product injuries and to assist the Commission in planning, budgeting, and evaluating projects.

The ICM is structured to measure the four basic categories of injury costs: medical costs, work losses, pain and suffering, and product liability and legal costs. Medical costs include doctor and hospital-related costs as well as diagnostic procedures, prescription drugs, equipment, supplies, emergency transportation, follow-up care, and administrative costs. Both the initial treatment costs and the costs of long term care are included.

Work-related losses represent the value of lost productivity, the time spent away from normal work activities as the result of an injury. Work-related losses include both the short-term losses resulting from being absent from work and the long-term losses resulting from permanent partial or total disability and its impact on lifetime earnings. They also include the value of work lost as a result of caring for injured children, the value of housework lost due to an injury, and the loss to the employer resulting from the disruption of the workplace.

Pain and suffering represents the intangible costs of injury, and is based on jury verdicts for consumer product-related injuries. Product liability and legal costs represent the resources expended in product liability litigation. These costs include the costs of administering the product liability insurance system (including the plaintiff's legal costs and the costs of defending the insured manufacturer or seller), the costs of claims investigation and payment, and general underwriting and administrative expenses; however, medical, work loss, and pain and suffering compensation paid to injury victims and their families is excluded, thus avoiding double counting.

The ICM estimates the costs of injuries reported through the National Electronic Injury Surveillance System (NEISS), a national probability sample of hospital emergency departments. The injury cost estimates depend on a number of factors, and vary by the age and sex of the injured person, the type of injury suffered, the body part affected, and whether or not the victim is hospitalized or treated and released. The ICM also uses empirically derived relationships between emergency department injuries and those treated in other settings (e.g. doctor's offices, clinics) to estimate the number of injuries treated outside hospital emergency departments and the costs of those injuries.

A number of databases are used to calculate the four cost categories. National discharge data and discharge data from six states are used to estimate the costs of hospitalized injuries. Data from the Civilian Health and Medical Program of the Uniformed Services (CHAMPUS) (which includes medical records from almost two million retirees and civilian dependents of military personnel) and several National Center for Health Statistics surveys dealing with costs of treatment in different medical settings are used to calculate medical costs for injuries where the victim is treated and released from the emergency department or treated in a clinic or doctor's office. Other major data sources include the Annual Survey of Occupational Illnesses and Injuries and the Detailed Claims Information (DCI) database for work loss estimates; and the Jury Verdicts Research data for pain and suffering estimates. Product liability and legal costs are derived analytically from insurance industry information and several studies of product liability.